COLOR LASER COPIER

200/300/350

SERVICE MANUAL

(for 115V)

REVISION 2

Canon

MAR. 1993

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INTRODUCTION

This SERVICE MANUAL is intended to provide the serviceman with a basic knowledge of the Color Laser Copier 200/300/350 and has been coplied to serve as a handy reference for ones work in the field.

The product is designed to enable full automation of copy work and, to this end, the following options are made available:

1. **Film Projector**
2. **Image Editing Unit VII**
3. **RDF-III**
4. **Offset Tray-II**
5. **Paper Deck-IX**
6. **IC Card**
7. **CCII/CCIII/CCV**
8. **IPU/PS-IPU**
9. **Film Scanner (CLC300/350 only; via IPU)**
10. **Film Scanner II (CLC350 only)**

The contents of this SERVICE MANUAL are concerned with the Color Laser Copier 200/300/350, Image Editing Unit VII, Offset Tray-II, and Paper Deck-IX; for the Film Projector, RDF-III, IC card, CCIII, CCV, IPU, PS-IPU, Film Scanner, and Film Scanner II, see their respective manuals.

In CHAPTER 1 GENERAL DESCRIPTION, a brief discussion of the Color Laser Copier 200/300/350's features, diagrams of its parts, and an explanation of its operation are given.

CHAPTER 2 COPYING PROCESS deals with the inner workings of the Color Laser Copier 200/300/350 which are associated with the generation of copies.

CHAPTER 3 OPERATIONS AND TIMING explains how the Color Laser Copier 200/300/350's electrical and mechanical systems are related to each other with respect to functions and timing of operations.

In CHAPTER 4 MECHANICAL SYSTEM, the Color Laser Copier 200/300/350 mechanical system is discussed as to its operation, disassembly, reassembly, and adjustment.

CHAPTER 5 INSTALLATION gives step-by-step instructions for installing the Color Laser Copier 200/300/350 together with checks to make for each step.

CHAPTER 6 MAINTENANCE AND SERVICING contains tables of replacement parts and consumables.

In addition to the above chapters, this SERVICE MANUAL contains a set of appendixes consisting of general timing charts and general circuit diagrams.

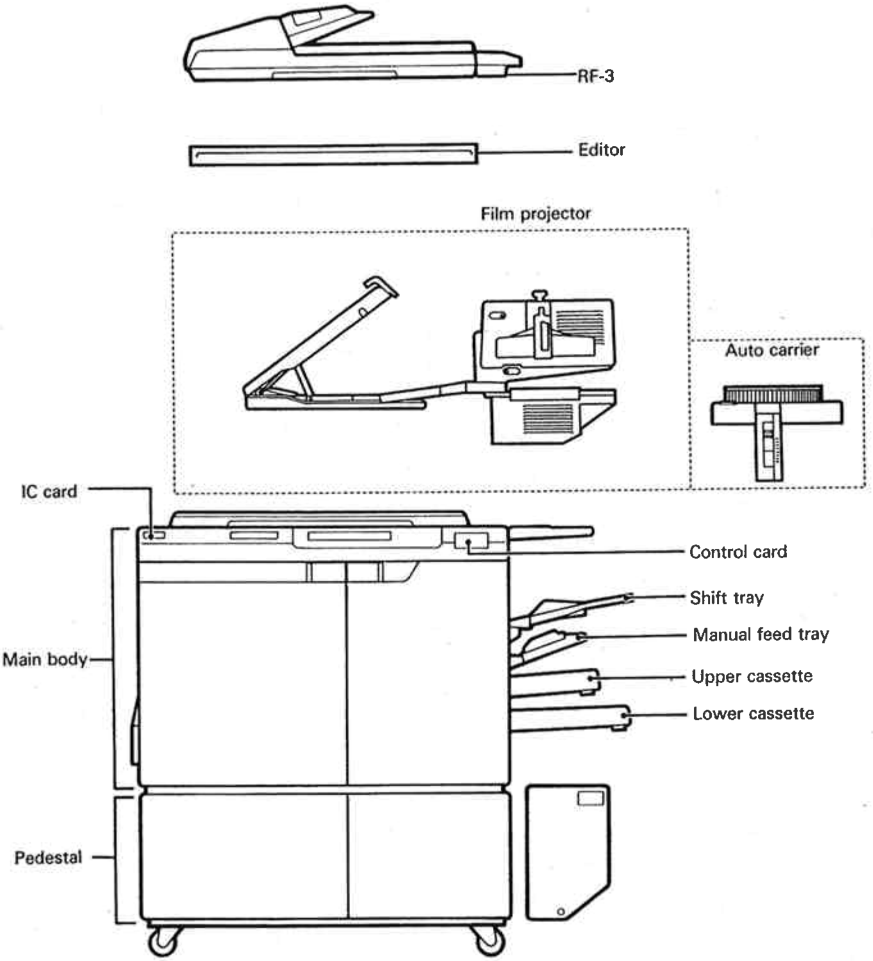
A separate document entitled SERVICE HANDBOOK is also available for troubleshooting problems in the Color Laser Copier 200/300/350.

The contents of this manual may be updated from time to time to reflect improvements rendered to the product; a Service Information bulletin will be issued as necessary to cover major changes.

All servicemen are expected to be thoroughly familiar with the information contained in this manual, SERVICE HANDBOOK, and Service Information Bulletins, for quick response to the user's needs.

Systems Overview

The Canon Laser Copier 200/300/350 make up the following system.


RF-3
Editor
Film projector
Auto carrier
IC card
Control card
Shift tray
Manual feed tray
Upper cassette
Lower cassette
Main body
Pedestal

Note:
If the IPU interface PCB is installed, you can connect to such external devices as a computer or a film scanner by way of the PS-IPU (PostScript Intelligent Processing Unit) or the IPU (Intelligent Processing Unit). The CLC350, on the other hand, may be directly connected to the Film Scanner II.

CONTENTS

CHAPTER 1 GENERAL DESCRIPTION

I. FEATURES 1-1
II. SPECIFICATIONS 1-2
  A. Construction 1-2
  B. Type 1-2
  C. Performance 1-3
  D. Others 1-5
  E. Image Editing Unit 1-7
  F. Offset Tray 1-7
  G. Paper Deck 1-7
III. ⚠ LASER AND SAFETY MEASURES 1-8
  A. DHHS 1-8
  B. CDRH 1-8
  C. Points to Note When Handling the Laser Unit 1-9
IV. NAMES OF PARTS 1-10
  A. Exterior View 1-10
  B. Cross Section 1-11

CHAPTER 2 COPYING PROCESS

I. IMAGE FORMATION 2-1
  A. Outline 2-1
  B. Formation of Electrostatic Latent Image 2-3
  C. Pre-Conditioning Exposure (step 1) 2-4
  D. Primary Corona Exposure (step 2) 2-4
  E. Image Exposure (step 3) 2-5
  F. Development (step 4) 2-5
  G. Attraction (step 5) 2-6
  H. Transfer (step 6) 2-7
  I. Separation (step 7) 2-7
  J. Drum Cleaning (photosensitive drum; step 8) 2-8
  K. Fixing (step 9) 2-8
II. AUXILIARY PROCESSES 2-9
  A. Static Eliminator 2-9
  B. Pre-Cleaning Corona Unit .. 2-9
  C. Ozone Filter 2-9
III. LIMITATIONS 2-10
  A. Outline 2-10
  B. Characteristics 2-10

CHAPTER 3 OPERATIONS AND TIMING

I. OUTLINE OF OPERATIONS ... 3-1
  A. Functional Construction ... 3-1
  B. Electrical Circuitry 3-2
  C. Inputs to and Outputs from Major PCBs 3-3
  D. Basic Sequence of Operations 3-16
  E. Generation of Image Leading Edge Signal 3-20
  F. Main Motor 3-23
  G. Drum Motor 3-24
II. EXPOSURE SYSTEM (Scanning lamp) 3-25
  A. Changing the Reproduction Ratios 3-25
  B. Basic Sequence of Operations (scanning lamp) 3-26
  C. Scanner Motor 3-28
  D. Scanning Lamp Control ... 3-29
III. IMAGE PROCESSING SYSTEM 3-30
  A. Outline 3-30
  B. CCD and CCD Driver 3-31
  C. Analog Image Processor PCB 3-32
  D. Digital Image Processor PCB 3-33
IV. EXPOSURE SYSTEM (laser) .. 3-47
  A. Outline 3-47
  B. Sequence of Operations ... 3-48
  C. Generation of BD Signal ... 3-49
  D. Laser Driver PCB 3-50
  E. Temperature Control for Laser Unit 3-51
  F. Laser Scanner Motor 3-52
V. IMAGE FORMATION SYSTEM 3-53
  A. Outline 3-53
  B. Sequence of Operations (image formation system) .. 3-54
  C. Image Stability Control 3-55
  D. Drum Surface Potential Control 3-56
  E. Drum Toner Concentration Control 3-62
  F. Primary Corona Current Control 3-66
  G. Attraction Corona Potential Control 3-67
  H. Transfer Corona Current Control 3-68
  I. Separation Corona Current Control 3-69
  J. Internal Static Eliminator Corona Current Control 3-70
  K. External Static Eliminator Corona Current Control ... 3-71
  L. Pre-Cleaning Corona Curren Control 3-72
  M. Photosensitive Drum Temperature Control 3-73
  N. Primary Corona Wire Cleaning Control 3-74
  O. Developing Assembly/ Photosensitive Drum Cleaning Unit 3-75
VI. PICK-UP AND FEEDER SYSTEM 3-93
  A. Outline 3-93
  B. Pick-up 3-94
  C. Transfer Drum 3-102
  D. Fixing Assembly and Delivery Unit 3-119
  E. Jam Detection 3-126
  F. Offset Tray 3-129
VII. CONTROL PANEL 3-131
VIII. IMAGE EDITING UNIT 3-132
  A. Outline 3-132
  B. Mechanism 3-132
  C. Zero-Adjustment for Input Coordinates 3-134
IX. FAN 3-135
X. POWER SUPPLY 3-137
  A. Power Supply 3-137
  B. Protection Mechanism for Power Supply Circuitry .. 3-137
XI. SERVICE MODE 3-141
  A. Outline 3-141
  B. Display Mode (DISPLAY) 3-143
  C. Adjustment Mode (ADJUST) 3-159
  D. Check Mode (FUNCTION) 3-174
  E. Options Mode (OPTION) 3-202
  F. Test Print Mode (TEST PRINT) 3-206
  G. Counter (COUNTER) 3-208
  H. Adjustments 3-209
  I. Test Prints 3-216
XII. SELF DIAGNOSIS 3-229

CHAPTER 4 MECHANICAL SYSTEM

I. EXTERNALS 4-1
  A. External Covers 4-1
  B. Fans and Blowers 4-5
II. DRIVE SYSTEM 4-9
  A. Drive Chain Layout 4-9
  B. Drum Motor 4-9
  C. Main Motor Drive Unit 4-12
  D. Transfer Drum Cleaner Unit 4-13
  E. Fixing Assembly/Feeder Unit Drive Unit 4-13
III. FEEDER SYSTEM 4-15
  A. Pick-Up Unit 4-15
  B. Feeder Unit 4-25
  C. Transfer Drum Unit 4-26
  D. Lower Feeder Unit 4-42
IV. SCANNING SYSTEM 4-43
  A. Scanning System 4-43
V. CORONA SYSTEM 4-52
  A. Photosensitive Drum Unit .. 4-52
  B. Corona Units 4-63
VI. DEVELOPING SYSTEM 4-67
  A. Developing Assembly 4-67
  B. Hopper Unit 4-84
VII. FIXING SYSTEM 4-87
  A. Fixing Assembly 4-87
  B. Fixing Assembly Cleaner Unit 4-93
  C. Delivery Unit 4-95
  D. Oil Application Unit 4-95
VIII. OPTIONS 4-97
  A. Removing the Offset Tray .. 4-97
  B. Removing the Image Editing Unit 4-98
  C. Removing the Paper Deck 4-98

CHAPTER 5 INSTALLATION

I. LOCATION 5-1
II. INSTALLATION (CLC 200)........ 5-2
IIa. INSTALLATION (CLC 300/350) ... 5-15
III. RELOCATION 5-30
IV. MOUNTING THE DOCUMENT TRAY 5-31
V. SETTING THE CASSETTE SIZE 5-32
VI. MOUNTING THE SOCKET FOR CCII/CCIII 5-34
VII. MOUNTING CCV 5-36
VIII. MOUNTING THE IC CARD UNIT 5-38

CHAPTER 6 MAINTENANCE AND SERVICING

I. PERIODICALLY REPLACED PARTS 6-1
II. DURABLES 6-2
III. PERIODICAL SERVICING 6-4
IV. PERIODICAL SERVICING CHART 6-5

APPENDIX

A. GENERAL TIMING CHART A-1
B. LIST OF SIGNALS AND ABBREVIATIONS A-2
C. GENERAL CIRCUIT DIAGRAM A-3
D. DC CONTROLLER CIRCUIT DIAGRAM A-5
E. CCD DRIVER CIRCUIT DIAGRAM A-25
F. ANALOG PROCESSOR CIRCUIT DIAGRAM A-27
G. SCANNER MOTOR DRIVER CIRCUIT DIAGRAM A-31
H. DEVELOPING ASSEMBLY SHIFT MOTOR DRIVER CIRCUIT DIAGRAM A-36
I. HVDC A-39
J. HVAC A-40
K. COLOR TONER CONCENTRATION ADJUSTING CIRCUIT DIAGRAM A-43
L. TONER CONCENTRATION SENSOR CIRCUIT DIAGRAM A-44
M. BLACK TONER CONCENTRATION ADJUSTING CIRCUIT DIAGRAM A-45
N. ENVIRONMENT MEASURING CIRCUIT DIAGRAM A-46
O. POTENTIAL MEASURING UNIT CIRCUIT DIAGRAM A-47
P. IMAGE EDITING UNIT GENERAL CIRCUIT DIAGRAM A-48
Q. IMAGE EDITING UNIT INTERFACE CIRCUIT DIAGRAM A-49
R. OFFSET TRAY GENERAL CIRCUIT DIAGRAM A-54
S. IPU INTERFACE CIRCUIT DIAGRAM A-55
T. SPECIAL TOOLS A-65
U. SOLVENTS AND OILS LIST .. A-67

CHAPTER 1

GENERAL DESCRIPTION

I. FEATURES 1-1
II. SPECIFICATIONS 1-2
  A. Construction 1-2
  B. Type 1-2
  C. Performance 1-3
  D. Others 1-5
  E. Image Editing Unit 1-7
  F. Offset Tray 1-7
  G. Paper Deck 1-7
III. ⚠ LASER AND SAFETY MEASURES 1-8
  A. DHHS 1-8
  B. CDRH 1-8
  C. Points to Note When Handling the Laser Unit 1-9
IV. NAMES OF PARTS 1-10
  A. Exterior View 1-10
  B. Cross Section 1-11

I. FEATURES

1. High-accuracy and high-quality images backed up by Canon's digital full-color laser technology.

Drawing fully upon Canon's digital full-color PPC technology, the machine boasts a resolution of about 16 lines per 1 mm. On top of this, each color may be processed for as many as 256 gradations, leading to sharp, crisp reproduction of documents in which text and photos co-exist (character/photo mode).

2. Automatic identification of mono or color documents.

When a document is set and the COPY START button is pressed, the ACS mechanism of the machine identifies the document and reproduces copies accordingly; i.e., in black if black and white, and in four colors if full color. As many as 20 copies can be made every minute; black mono, A4/LTR.

3. Drum toner concentration control. (CLC300/350 only)

The machine's drum toner concentration control mechanism* monitors the concentration of toner on the drum taking measurements to be used as feedback for potential control and image processing. Because of the mechanism, solid black images are reproduced as solid and gradation is free of fluctuation.

*SALT (Stabilizing Application for Linearity of Tone).

4. Simple operation.

Once the document is placed, all that is required to produce full-color copies is a press on the COPY START key; and, whenever help is needed, press the GUIDE key to bring up necessary descriptions on the message display.

5. A wide variety of options for extra features.

Expand the capabilities of the machine by simply attaching the film projector, image editing unit, or document feeder. The machine is designed to accommodate all these to enable copying from 35-mm film, editing the documents, or simply easing the copy work.

Color balance may be obtained automatically when copies are made of negative film using a film projector.

Further, if the machine is equipped with an IPU interface PCB, it can be connected to a computer, film scanner, or other external devices by way of the PS-IPU or the IPU.

6. Two-sided copy/counterfeit protection system. (CLC350 only)

The machine is capable of making two-sided copies (manual), and is equipped with counterfeit protection system.

II. SPECIFICATIONS

A. Construction

Body	Desk top (scanner and printer in one)
Copyboard	Fixed
Light source	Halogen lamp (235 W)
Lens	Fixed focus
Scanning	Photocell (BGR 3-line CCD, fixed); mirror scan
Photosensitive medium	OPC drum

B. Type

Copying	Indirect electrostatic (laser beam)
Charging	Corona
Exposure	Laser beam
Contrast	Auto/manual adjustment
Development	J/B (projection and brush) (M, C, Y, Bk)
Toner supply	Manual (345 g/bottle)
Pick-up	Cassettes (2, exclusive), manual feed tray
	Cassette (1, exclusive), paper deck (option), manual feed tray
Attraction	Electrostatic (gripperless)
Transfer	Corona (transfer sheet)
Separation	Claw/Push-up roller (separation corona unit as auxiliary)
Cleaning	Blade
Fixing	Heat roller (400 W × 2)

C. Performance

Document type		Sheet, book, 3-D object (2 kg/4.4 lb. max.)	
Document size		A3 (297 × 420 mm)/LDG (11″ × 17″)	
Reproduction ratio		Fixed: DIRECT (±0.5%), ENLARGE/REDUCE (±1.0%; see Table 1-1.) Zoom: 50% to 400% (±1.0%)	
Warm-up (20°C/68°F)	CLC200	8 min (approx.), 3 min (approx.; pre-heat)	
	CLC300/350	10.5 min (including SALT control), 3 min (approx.; pre-heat)	
First copy (A4/LTR)	CLC200/300	Document identification w/o scan	43.5 sec (approx.; full color) 25.5 sec (approx.; MCYBk)
		Document identification w/ scan	47.5 sec (approx.; full color) 29.5 sec (approx.; MCYBk)
	CLC350	Document identification w/o scan	45 sec (approx.; full color) 27 sec (approx.; MCYBk)
		Document identification w/ scan	49 sec (approx.; full color) 31 sec (approx.; MCYBk)
Continuous copying		100 copies max.	
Copying speed		See Table 1-2.	
Copy size	Cassette	A3 (297 × 420 mm)/LDG (11″ × 17″) max. B5R (182 × 257 mm)/LTR (8.5″ × 11″) min.	
	Manual feed tray	297 × 432 mm (11.7″ × 17″) max. 182 × 257 mm (7.2″ × 10.1″) min.	
Copy type	Cassette/paper deck	Plain paper (80 g/m²)	
	Manual feed tray	OHP film (special), plain paper (80 to 104 g/m²)	
	Two-sided copy (CLC350 only)	Thick paper (104 g/m²)	
Cassette*		No claw, centered design; 27 mm (1.06 in.) deep, about 250 sheets of 80 g/m² paper	
Paper deck*		No claw, centered design; 108 mm (42.52 in.) deep, about 1,000 sheets of 80 g/m² paper	
Copy tray capacity		100 sheets (approx., 80 g/m²)	
Shift tray capacity		100 sheets (approx., 80 g/m²)	
Non-image width on original (non-reproduced area)		Leading edge: 8.0 ±1.0 mm/0.31 ±0.04 in. Trailing edge: 2.0 ±1.0 mm/0.08 ±0.04 in. (ref. value) Left/right: 2.0 ±1.0 mm/0.08 ±0.04 in.	
Non-image width on copy (blank area)		Leading edge: 8.0 ±1.5 mm/0.31 ±0.06 in. Left/right: 2.0 +2.0, −1.5 mm/0.08 +0.08, −0.06 in.	
Resolution	Main scanning direction	400 DPI (dot/in.; 15.7 dots/mm)	
	Sub scanning direction	400 LPI (line/in.; 15.7 lines/mm)	

Others	Auto clear	2 min standard; may be modified or de-activated in service mode.
	Pre-heat	30 min standard; may be modified or de-activated in service mode.
	Auto color selection	Identifies color or black/white document and selects 4-color copy or black mono copy.
	Auto exposure	For mono-color only.
	Auto paper selection	Available.
	Auto zoom	Available.
Options		Image Editing Unit, RDF-III, Paper Deck, Offset Tray, Film Projector, CCII, CCIII, CCV, IC Card, IPU**, PS-IPU**, Film Scanner***, Film Scanner II****

* May be re-set by the serviceman to accommodate different sizes.

** CLC300/350 only.
*** CLC300/350 only. (via IPU)
**** CLC350 only.

D. Others

Operating environment		Temperature: See Figure 5-1. Humidity: See Figure 5-1. Atmospheric pressure: 0.8 to 1 atm		
Power supply (voltage ±10%)		Model	CLC200	CLC200 with Editor
		115V 60Hz	CVB xxxx CVV xxxxx	CVH xxxxx CVW xxxxx
		220 V 50HZ	DVB xxxxx DVV xxxxx	
		240V 50Hz (UK)	EVB xxxxx EVV xxxxx	EVH xxxxx EVW xxxxx
		240V 50Hz (CA)	FVB xxxxx FVV xxxxx	
		220V 50Hz (FRN)	GVB xxxxx GVV xxxxx	
		220V 50Hz (GER)	HVB xxxxx HVV xxxxxx	
		220 V 50Hz (AMS)	KVB xxxxx KVV xxxxx	
		Model	CLC300	CLC350
		115V 60Hz	NAY xxxxx	NRW xxxxx
		115V 60Hz (TWN)	NEL xxxxx	NRX xxxxx
		220V 50Hz	PAY xxxxx	PRW xxxxx
		240V 50Hz (UK)	QAY xxxxx	QRW xxxxx
		240V 50Hz (CA)	RAY xxxxx	RRW xxxxx
		220V 50Hz (FRN)	SAY xxxxx	SRW xxxxx
		220V 50Hz (GER)	TAY xxxxx	TRW xxxxx
		220V 50Hz (AMS)	UAY xxxxx	URW xxxxx
Power consumption		1.5 kW or less 0.75 kW (approx., copying; full-color, continuous)* 0.29 kW (approx., standby; pre-heat OFF)* *Reference only.		
Noise (1 m from machine)		55 dB (copying) 45 dB (standby)		
Ozone		0.1 ppm or less (average over 8 hr.)		
Consumables	Paper	Keep wrapped in package to protect against humidity.		
	Toner	Avoid direct rays of sun, and keep at 40°C/104°F.		
Dimensions		Width: 866 mm/34.1 in. (w/ manual feed tray) Depth: 735 mm/28.9 in. Height: 629 mm/24.8 in. (w/ copyboard cover) 632 mm/24.9 in. (w/ image editing unit)		
Weight		167 kg/368 lb. (w/ drum, copyboard cover) 169 kg/373 lb. (w/ drum, image editing unit)		

Destination	REDUCE		ENLARGE	
Japan, Australia		0.500	B4 → A3 B5R → A4R B5 → A4	1.154
	A3 → A4R B4 → B5R	0.707		
	B4 → A4R	0.816	A4R → B4	1.224
	A3 → B4 A4R → B5R	0.865	A4R → A3 B5R → B4	1.414
				2.000
				4.000
North America		0.500	LGL → 11″ × 17″	1.214
	11″ × 17″ → LTRR	0.647	LTRR → 11″ × 17″	1.294
	11″ × 17″ → LGL	0.733		
	LGL → LTRR	0.786		
				2.000
				4.000
Europe		0.500	A4R → A3	1.414
	A3 → A4R	0.707		2.000
				4.000

Table 1-1 Fixed Reproduction Ratios

Copy size	4-color (YMCBk)	3-color (YMC)	2-color (BGR)	Mono-color (YMCBk)	4-color* (YMCBk)
A3	2.5	3.3	5.0	10.0	1.25
B4	2.5	3.3	5.0	10.0	1.25
A4-R	2.5	3.3	5.0	10.0	2.5
B5-R	2.5	3.3	5.0	10.0	2.5
A4	4.5	5.7	5.0	20.0	2.5
B5	4.5	5.7	5.0	20.0	2.5
11″ × 17″	2.5	3.3	5.0	10.0	1.25
LGL	2.5	3.3	5.0	10.0	1.25
LTR-R	2.5	3.3	5.0	10.0	2.5
LTR	4.5	5.7	5.0	20.0	2.5

* Film scanner II/Film projector/OHP in use.

Table 1-2 Copy Speeds (copies/min)

Specifications are subject to change for product improvement.

E. Image Editing Unit

Type	Electrostatic
Power source	5 VDC (from host)
Weight	3.8 kg/8.4 lb.
Dimensions	554 × 489 × 40 mm/21.8 × 19.3 × 1.6 in.
Serial Nos.	JUU xxxxx

F. Offset Tray

Type	Face-up loading; right/left shifting
Capacity	100 sheets (approx.; A4, 80 g/m²)
Power source	24 VDC (from host)
Weight	1.2 kg/2.6 lb. (excluding tray)
Dimensions	86 × 470 × 137 mm/3.4 × 18.5 × 5.4 in. (excluding tray)
Serial Nos.	JTC xxxxx

G. Paper Deck

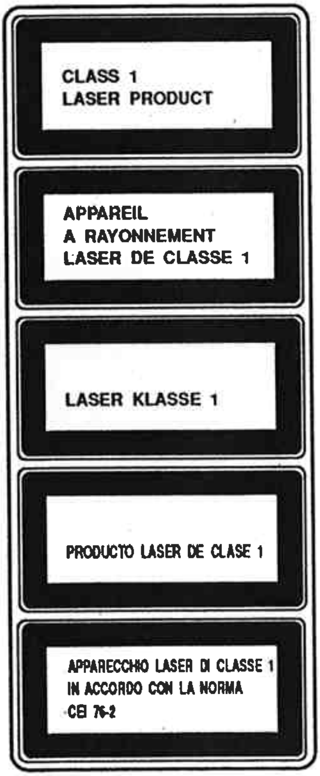
Capacity	108 mm in height (1,000 sheets of A4, 80 g/m²)
Weight	4.3 kg/9.5 lb.
Dimensions	158 × 377 × 230 mm/6.2 × 14.8 × 9.1 in. (area outside host)
Serial Nos.	JSZ xxxx (A4/B5) JTB xxxx (LTR)

III.⚠LASER AND SAFETY MEASURES

A. DHHS

The CLC200/300/350 has been approved as Class 1 equipment under the Radiation Performance Standards of the Department of Health and Human Services (DHHS), established in the U.S.A. in 1968.

The approval represents that the product has shown to be free of harmful laser beams; the optical system of the product is designed such that the laser beams are confined in a protective housing and cannot escape the product while in use at the user's.



CLASS 1
LASER PRODUCT

APPAREIL
A RAYONNEMENT
LASER DE CLASSE 1

LASER KLASSE 1

PRODUCTO LASER DE CLASE 1

APPARECCHIO LASER DI CLASSE 1
IN ACCORDO CON LA NORMA
CEI 76-2

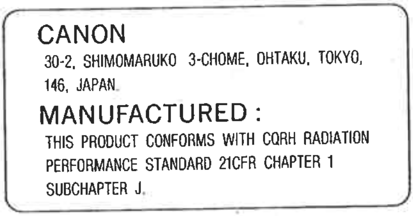
Figure 1-1

B. CDRH

On August 2, 1976, the Center for Devices and Radiological Health (CDRH) of the Food and Drug Administration of the U.S.A. put an act in force to deal with laser devices.

Under the act, laser devices manufactured on and after August 1, 1976, may not be marketed in the United States without approval.

Figure 1-2 shows the label which serves as proof of approval under the act; the label is required to be attached to all laser devices marketed in the U.S.A.



CANON
30-2, SHIMOMARUKO 3-CHOME, OHTAKU, TOKYO,
146, JAPAN
MANUFACTURED :
THIS PRODUCT CONFORMS WITH CQRH RADIATION
PERFORMANCE STANDARD 21CFR CHAPTER 1
SUBCHAPTER J.

Figure 1-2

Note:
The description may vary from product to product.

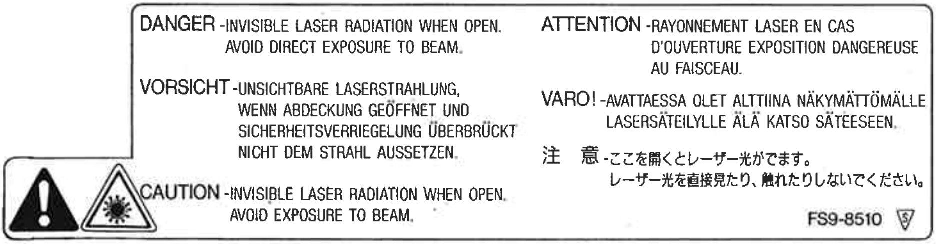
C. Points to Note When Handling the Laser Unit

When servicing the optical unit of the product, take adequate care no to intercept the laser path with a tool having a high reflectance.

As a rule, remove the watch, ring, or the like before work; such items tend to reflect the beam and damage the eyes.

Laser beams are not visible; remain alert when servicing inside the covers on which the label is attached.

The machine is equipped with a shutter which blocks out the laser beam when the front left door is opened; therefore, when images are checked with the front left door open, the shutter needs to be held open using a door switch actuator. Be sure to observe the notes to keep in mind above when such work is necessary.



DANGER -INVISIBLE LASER RADIATION WHEN OPEN. AVOID DIRECT EXPOSURE TO BEAM.

VORSICHT -UNSICHTBARE LASERSTRAHLUNG, WENN ABDECKUNG GEÖFFNET UND SICHERHEITSVERRIEGELUNG ÜBERBRÜCKT NICHT DEM STRAHL AUSSETZEN.

CAUTION -INVISIBLE LASER RADIATION WHEN OPEN. AVOID EXPOSURE TO BEAM.

ATTENTION -RAYONNEMENT LASER EN CAS D'OUVERTURE EXPOSITION DANGEREUSE AU FAISCEAU.

VARO! -AVATTAESSA OLET ALTTIINA NÄKYMÄTTÖMÄLLE LASERSÄTEILYLLE ÄLÄ KATSO SÄTEESEEN.

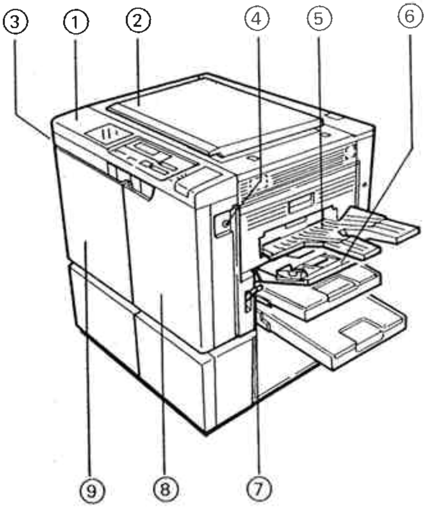
注　意 -ここを開くとレーザー光がでます。レーザー光を直接見たり、触れたりしないでください。

FS9-8510

Figure 1-3

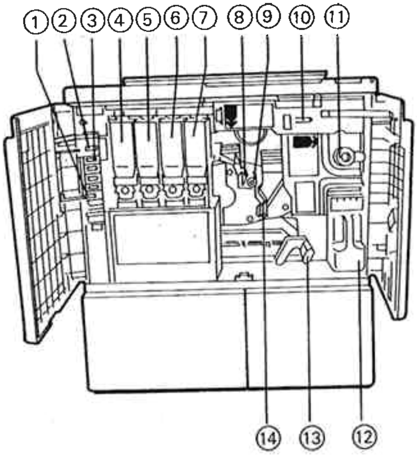
IV. NAMES OF PARTS

A. Exterior View



① Control panel
② Copyboard cover
③ Power switch
④ Security key
⑤ Copy tray
⑥ Manual feed tray
⑦ Manual feed tray switch lever
⑧ Right front door
⑨ Left front door

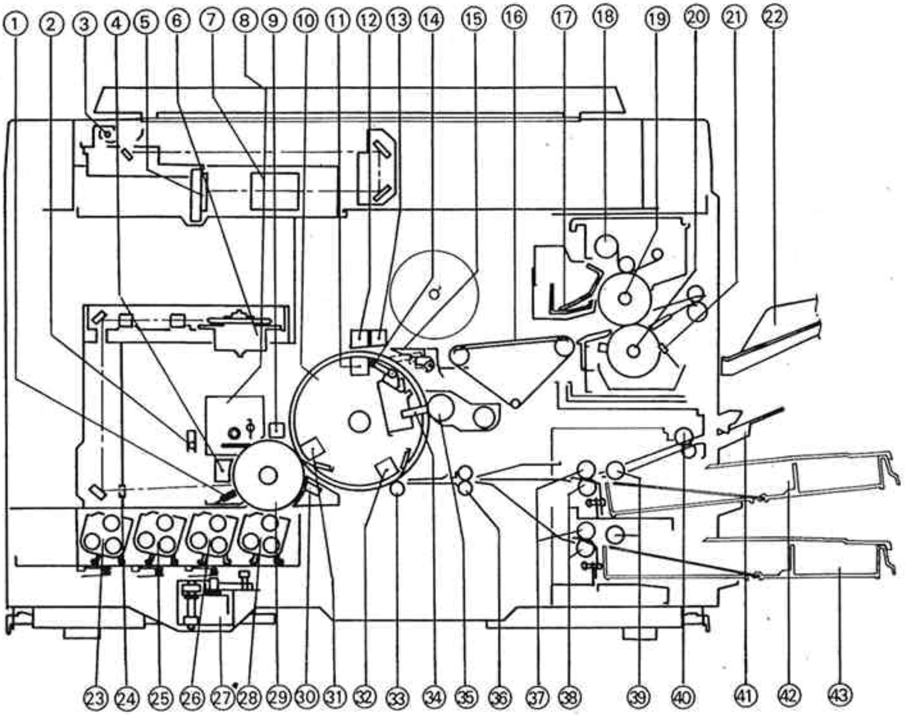
Figure 1-4a



① Laser shutter actuator
② Counter
③ Left door switch
④ Bk toner case
⑤ Y toner case
⑥ C toner case
⑦ M toner case
⑧ Separation unit release lever
⑨ Transfer drum knob
⑩ Right door switch
⑪ Fixing assembly knob
⑫ Oil bottle
⑬ Lower feeder unit release lever
⑭ Transfer drum release lever

Figure 1-4b

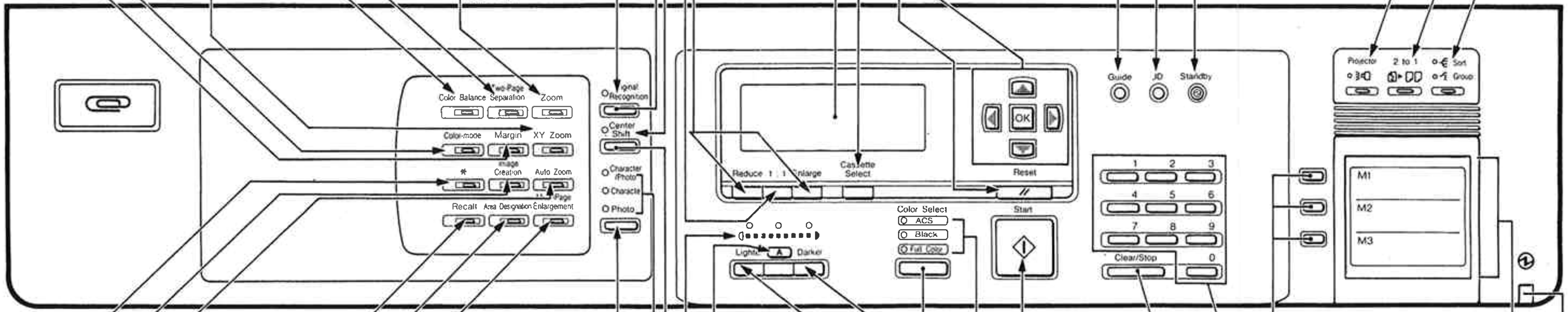
B. Cross Section



① Potential sensor
② Pre-exposure lamp
③ Scanning lamp
④ Primary corona unit
⑤ CCD
⑥ Laser scanner
⑦ Lens
⑧ Photosensitive drum cleaner
⑨ Pre-cleaning corona unit
⑩ Transfer drum
⑪ Internal static eliminator
⑫ External static eliminator
⑬ Separtion corona unit
⑭ Separation push-up roller
⑮ Separation claw
⑯ Feeder belt
⑰ Oil application felt
⑱ Cleaning belt
⑲ Upper fixing roller
⑳ Lower fixing roller
㉑ Oil blade
㉒ Copy tray
㉓ Bk developing assembly
㉔ Dust glass
㉕ Y developing assembly
㉖ C developing assembly
㉗ Developing assembly engagement block
㉘ M developing assembly
㉙ Photosensitive drum
㉚ Black toner concentration sensor
㉚ Transfer corona unit
㉜ Attraction corona unit
㉝ Attraction roller
㉞ Inside brush
㉟ Transfer drum cleaner
㊱ Registration roller
㊲ Feeder roller
㊳ Separation roller
㊴ Pick-up roller
㊵ Manual feed tray pick-up roller
㊶ Manual feed pick-up tray
㊷ Upper cassette
㊸ Lower cassette

Figure 1-5

Operation Panel



Margin Key
Creates a margin on the right or left.

Color Mode Key
Set 3 color, one of 6 colors.

X/Y Zoom
Sets the ratio of the length and width independently.

Color Balance Key
Adjusts fine color balance.

Two-page Separation
Copies two facing pages of a book or magazine in one step.

Zoom Key
Reduces or enlarges from 50% to 400% in 1% increments.

Reducing/Enlarging with Fixed Ratios
Use to enlarge or reduce from a standard size original to a larger or smaller standard size copy.

1:1 Key
Returns enlargement or reduction function to direct copy (100%).

Center Shift Indicator
Lights when the center shift mode is set.

Original Recognition Key
Press to set or release automatic original recognition mode.

Original Recognition Indicator
Lights when the original recognition mode is set.

Message Display
Displays the current copy mode or setting instruction.

Cassette Select Key
Selects the cassette for the paper to be used.

Reset Key
Cancels the current copy mode and returns to the standard mode.

Control Keys
Used to set or adjust functions on the message display.

Guide Key
Displays explanation of function or operating method.

ID Key
Use to register code number or to copy using code number.

Standby Key
Press, to turn the standby function ON or OFF.

Sort/Group Key
Press to set or release sort mode and group mode.

2 to 1 Key/Indicator (CLC 200/300)
Turns 2-sided originals into two 1-sided copies (Feeder is necessary)

Two-Sided key (CLC350)
Press the key to make two-sided copies.

Projector Key/Indicator
When using the projector

Character/Photo Mode Key
Sets the mode to copy originals with characters only, photos only, or characters and photos.

Character/Photo Mode Indicator
Lamp for selected mode lights up.

Auto Zoom Key
Automatically calculates zoom ratio according to the size of the original and the paper.

Image Creation Key
Sets the negative/positive reversal, mirror image, image repeated, map mode and sharpness.

⊛Asterisk Key
Used to determine the zoom ratio to match the paper size or to record the copy mode.

Multi-Page Enlargement Key
Used to enlarge to a size larger than the copy paper.

Center Shift Key
Shifts the original to the center of the copy paper.

Exposure Indicator
Indicates selected exposure. "A" lights up when set on automation exposure adjustment is turned on.

Area Designation Key
Designates areas to be edited.

Recall Key
Can recall up to the three previously used copy modes.

When CLC 300/350 is connected to a) a PostScript intelligent processing unit (PS-IPU) or an intelligent processing unit (IPU), your Service Representative can change this key so that it functions as a Remote Key. The Remote Key is used to cancel the Remote Function. (When the remote function is set the copier can only be operated through the host computer.) For further details, see page 3-205.

AE (Automatic Exposure Adjustment) Key
Automatically adjusts the exposure to for the original.

Start Key
Press to start copying.

Color Select Indicator
When color mode lamp is selected, the Color Select Key lights up.

Color Select Key
ACS: The machine senses if the original is full color or black and white.
Black: Use for black and white copying.
Full color: Use for four full color copying.

Manual Exposure Key
Adjusts copy exposure (lighter or darker).

Mode Memory Key
Used to recall the copy modes recorded in memory.

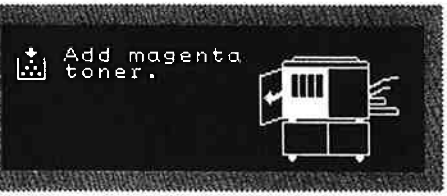
Mode Memory Indicator
This space is available to write down the modes in each memory.

Number Key
Sets the number of copies and/or zoom ratio.

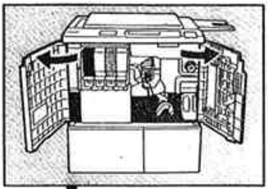
Pilot Lamp
Green lamp lights when the power is on.

Clear/Stop: C/⊘ Key
Press to change number input or to interrupt copyrun.

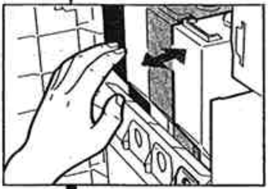
Adding Toner



Add magenta toner.

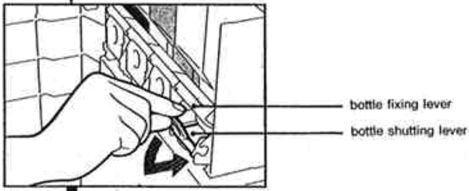


Open the front door.

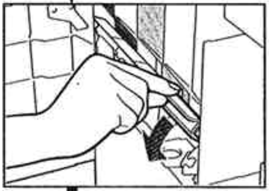


Empty all the toner from the bottle by lightly tapping the surface of the toner bottle 2 or 3 times.

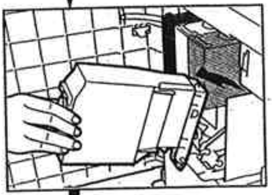
- The toner fill holes are arranged in order from the right: magenta, cyan, yellow and black.
- Use the toner exclusively for the Canon Color Laser Copier 200/300/350.
- When adding toner make sure that the toner bottle color matches the color of the toner bottle fill hole. Problems may result if different color toners are mixed. Also, using toner designed for another machine may lead to problems and thus should be avoided.
- The toner may be replenished by lightly tapping the toner bottle 2 or 3 times. Close the front door then check the message display.



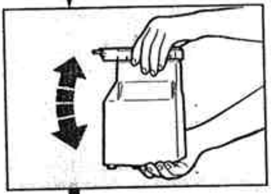
Lower the bottle shutting lever toward you until it is horizontal. Then push it firmly into the machine.



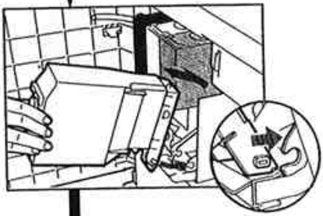
Pull the bottle fixing lever down toward you.



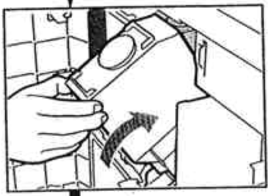
Pull the empty toner bottle down toward you and remove it as shown.



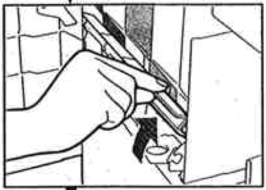
1. Prepare a new toner bottle that is the same color as the toner that has run out.
2. Holding the toner bottle in both hands, turn it upside-down at least 5 times and shake it slowly.



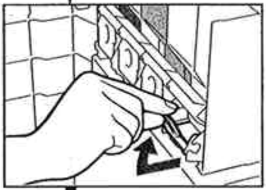
Insert the protruding section of the toner bottle into the notch of the bottle fixing lever.



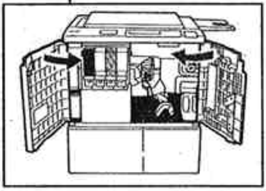
Rotate the bottle and slowy push it in.



Lock the bottle fixing lever in the up position.



Pull the bottle shutting lever out toward you and lock it in the up position.



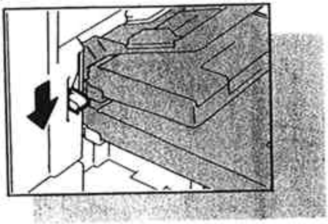
Gently close the front doors.

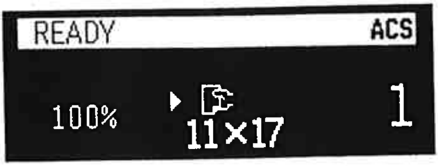
Making Two-Sided Copies (CLC 350 only)

- Two-sided copies can only be made by manual feeding. Do not feed paper from the paper cassette.

Changing to Manual Feed

Lower the Manual Feed Lever.





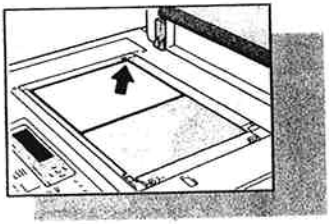
READY ACS

100% 11×17 1

- Press the OK key to skip the Manual Feed Size Selection. The display on the left will appear.
- Normally, do the Manual Feed Size Selection before starting a two-sided copy. (See page 82.)

Set the 1st side of the Original

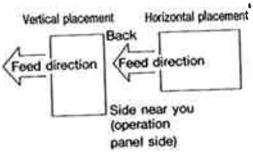
Set the 1st side of the original on the copyboard.

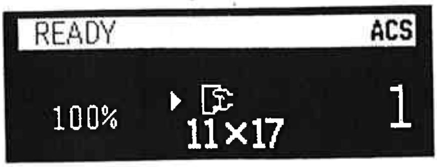


- When copying dark originals, copy the darker side on side two.
- When manual feeding, only one copy at a time can be made, regardless of the setting.
- When making two-sided copies, use paper recommended by Canon. The suitable paper weight is 28lb bond (105g/m²). The size of the paper should be between 11"×17" and LTR.
- Always remove any curls in the paper before inserting into the machine.

Insert the Paper

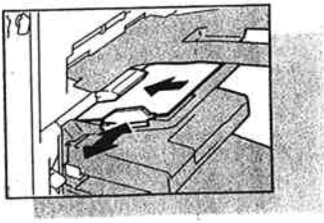
1. Insert the paper to be copied face down.
2. Insert the copy paper along the manual feed guides until it is automatically drawn in the machine.
   Check to see if the "Set the paper." display has gone out.





READY ACS

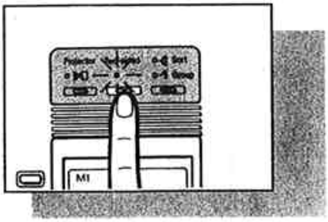
100% 11×17 1



- When the copy paper does not go in straight, jamming may occur. To prevent this insert the paper carefully along the manual guide.

Select the Two-Sided Mode

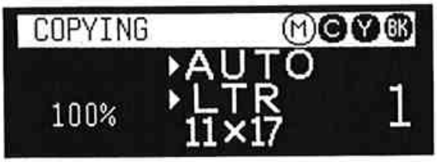
Press the Two-Sided key.



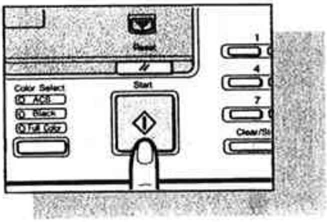
- When making two-sided copies, press the Two-Sided key first, then feed the first side manually.
- Never attempt to make two-sided copies by copying on either side from the paper cassette, or by manually feeding the first side without pressing the Two-Sided Copy key first. This can cause malfunctions to occur.

Start Copying the 1st Side

Press the Copy Start key.
The copy paper will be fed into the copier and the first side copied.



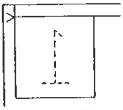
COPYING Ⓜ Ⓒ Ⓨ ⒷⓀ
▸AUTO
▸LTR
100% 11×17 1



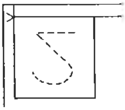
Set the 2nd Side of the Original

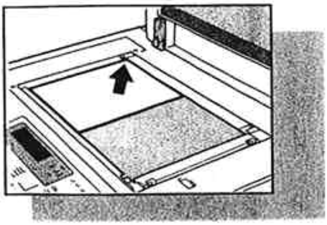
Set the 2nd side of the original on the copyboard. The original should point the opposite direction of the 1st side.

1st side in place



2nd side in place

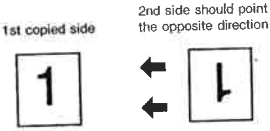




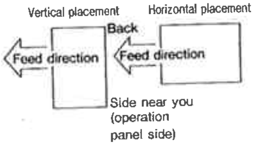
- When copying dark originals, copy the darker side on side two.
- When manual feeding, only one copy at a time can be made, regardless of the setting.

Insert the Paper

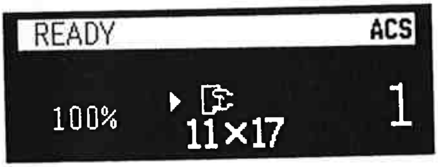
1. Insert the copy paper into the machine, 1st copied side up (side for copying down) and pointing in the opposite direction.

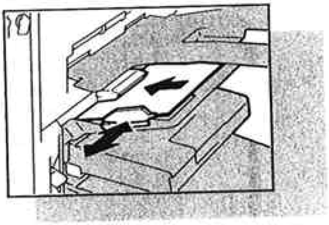

1st copied side
2nd side should point the opposite direction
1

- When making two-sided copies, use paper recommended by Canon. The suitable paper weight is 28lb bond (105g/m²). The size of the paper should be between 11"×17" and LTR.


Vertical placement
Horizontal placement
Back
Feed direction
Feed direction
Side near you (operation panel side)

2. Insert the copy paper along the manual feed guides until it is automatically drawn in the machine. Check to see if the "Set the paper." display has gone out.

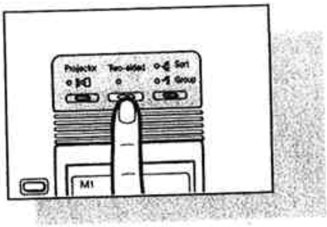

READY ACS
100% 11×17 1



- Always remove any curl from the paper before inserting into the machine.
- When the copy paper does not go in straight, jamming may occur. To prevent this, insert the paper carefully along the manual guide.

Press Two-Sided Key Again

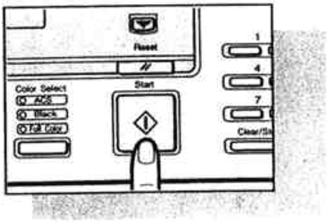
Press the Two-Sided key again (the Two-Sided key indicator will go out).

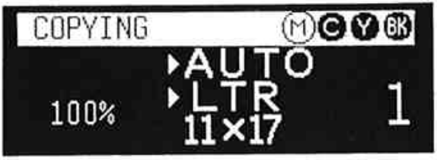

Projector
Two-sided
Sort
Group
M1

- To make multiple two-sided copies, press the Two-Sided key to light the indicator. Then, copy as many first-side originals as necessary.
- Before manually feeding the 2nd sides, press the Two-Sided key again so that the indicator goes out. Then, copy the second-side originals.

Start Copying the 2nd Side

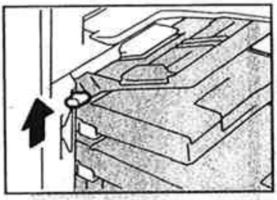
Press the Copy Start key.
Copy paper will be fed into the copier and copied on.


Reset
Start
Color Select
ACS
Black
Full Color
1
4
7
Clear/St


COPYING Ⓜ Ⓒ Ⓨ ⒷⓀ
▸AUTO
100% ▸LTR 1
11×17

After Copying is Finished

Raise the Manual Feed Lever to its original position.



- The upper cassette cannot be used unless the manual feed level is returned to its original position.

Manual Feed With Automatic Zoom and Center Shift

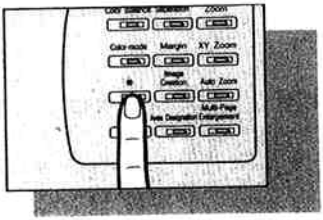
When using functions that specify paper size (such as Automatic Zoom and Center Shift) with manual feed copying, or when copying on non-standard size paper, designate the paper size.

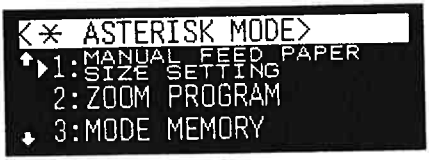
[illegible]

■When copying on standard size paper

[illegible]

1. Press the ⊠ (Asterisk) Key.
   The following message will be displayed.

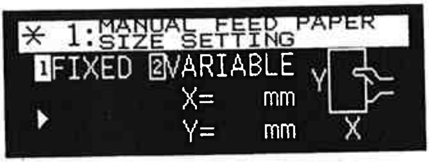




```
<✳ ASTERISK MODE>
▶1:MANUAL FEED PAPER
   SIZE SETTING
 2:ZOOM PROGRAM
 3:MODE MEMORY
```

2. Press the ▲▼ Keys to select 1 (manual Feed Paper Size Setting). Then press the OK Key or the ⊠ Key.

- You can also select "Manual feed paper size setting" by pressing the Number Key 1.
  (1mm = 0.03937 inch)

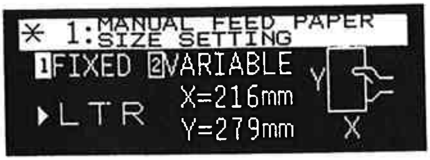


```
✳ 1:MANUAL FEED PAPER
    SIZE SETTING
 1FIXED 2VARIABLE   Y
              X=    mm
▶             Y=    mm   X
```

[illegible]

Press the ▲▼ Keys to select the paper size.
Then press the OK Key.

- The standard sizes that can be selected are; 11" x 17", LGL, LTR/LTR-R, A3, B4, A4, A4R, B5 and B5R.

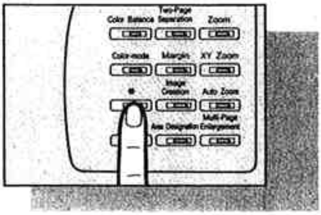


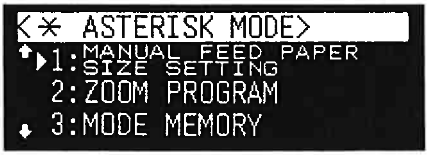
```
✳ 1:MANUAL FEED PAPER
    SIZE SETTING
 1FIXED 2VARIABLE   Y
              X=216mm
▶LTR          Y=279mm  X
```

■When Copying on Non-Standard Size Paper

[illegible] Size Setting

1. Press the ⊠ (Asterisk) Key.
   The following message will be displayed.

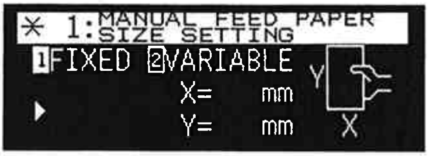

Two-Page Separation
Color Balance
Zoom
Color-mode
Margin
XY Zoom
Image Creation
Auto Zoom
Area Designation
Multi-Page Enlargement



```
<✳ ASTERISK MODE>
▶1:MANUAL FEED PAPER
   SIZE SETTING
 2:ZOOM PROGRAM
 3:MODE MEMORY
```

2. Press the ▲▼ Keys to select 1 (Manual feed paper size setting). Then press the OK Key or the ⊠ Key.

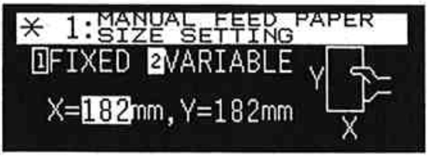
- You can also select "Manual feed paper size setting" by pressing the Number Key 1. (1mm ≒ 0.03937 inch)



```
✳ 1:MANUAL FEED PAPER
    SIZE SETTING
1FIXED 2VARIABLE
▶       X=    mm
        Y=    mm
```

[illegible]

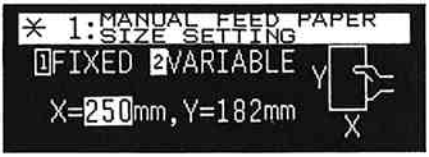
1. Press the ▶ Key to select 2.



```
✳ 1:MANUAL FEED PAPER
    SIZE SETTING
1FIXED 2VARIABLE
 X=182mm,Y=182mm
```

2. Press the ▲▼ Keys to designate the horizontal length (X) of the paper.
   Press the ▲ Key to increase the number.
   Press the ▼ Key to decrease the number.

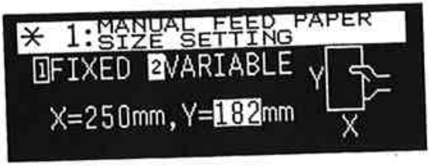
- Non-standard paper sizes that can be set:
  X (horizontal) direction 182-432mm
  Y (vertical) direction 182-297mm
- The ▲▼ Keys increase or decrease the size in 1 mm increments each time they are pressed. If they are pressed continuously they move the size up and down in 10mm increments.
- The size can also be set using the Number Keys (0 to 9). The number will flash during the setting.



```
✳ 1:MANUAL FEED PAPER
    SIZE SETTING
1FIXED 2VARIABLE
 X=250mm,Y=182mm
```

3. Press the ▶ Key to designate the vertical length (Y) of the paper. The following message is displayed.

- When the ▶ Key is pressed it will return to the mode for designating the horizontal width of the paper.
(1mm = 0.03937 inch)

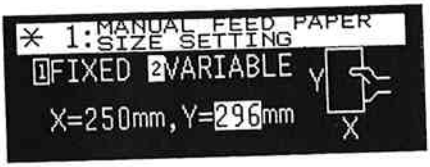


* 1:MANUAL FEED PAPER SIZE SETTING

1FIXED 2VARIABLE

X=250mm, Y=182mm

4. Designate the vertical length (Y) of the paper.



* 1:MANUAL FEED PAPER SIZE SETTING

1FIXED 2VARIABLE

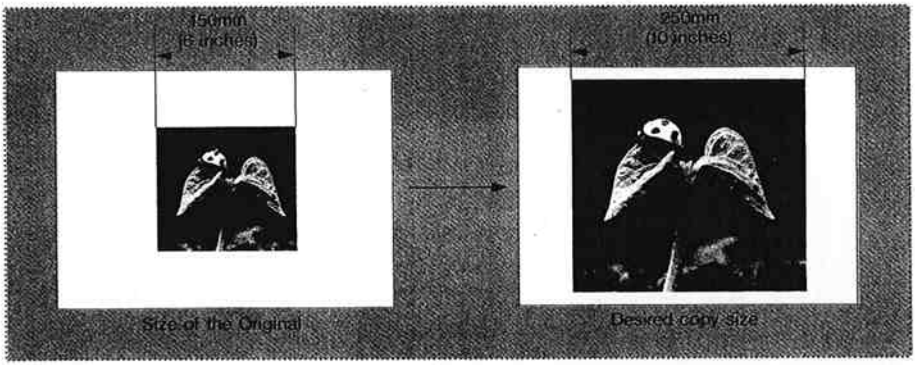
X=250mm, Y=296mm

5. Press the OK Key when setting is completed.

Calculating the Zoom Ratio Automatically

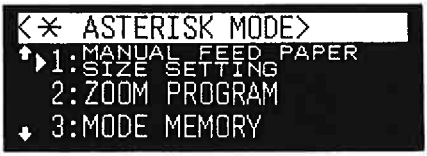
When the size of the otiginal and the copy size are input, the Copying Machine automatically calculates the enlargement/ reduction ratio.

ZOOM PROGRAM

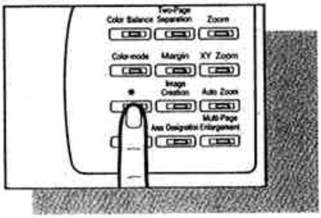

150mm
(6 inches)
250mm
(10 inches)
Size of the Original
Desired copy size

Select the "Zoom Program"

1. Press the ☒ (Asterisk) Key.
   The following message is displayed.



```
<* ASTERISK MODE>
↑▶1:MANUAL FEED PAPER
    SIZE SETTING
  2:ZOOM PROGRAM
↓ 3:MODE MEMORY
```

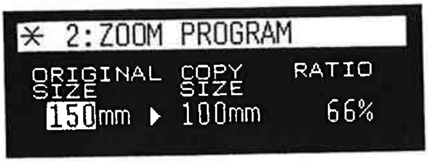

Two-Page Separation
Color Balance
Zoom
Color-mode
Margin
XY Zoom
*
Image Creation
Auto Zoom
Area Designation
Multi-Page Enlargement

2. Press the ▲▼ Keys to select 2 (Zoom Program).
   Then press the OK or ☒ Keys.

- You can also select "Zoom Program" by pressing Number Key 2.
  (1mm = 0.03937 inch)

Designate the Size of the Original and the Size of the Copy

1. Specify the original size.
   Press the ▲ Key to increase the number.
   Press the ▼ Key to decrease the number.



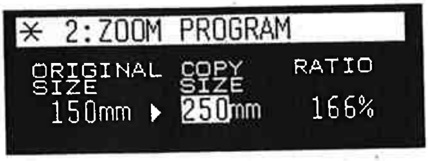
```
* 2:ZOOM PROGRAM
ORIGINAL   COPY     RATIO
SIZE       SIZE
 150mm ▶  100mm      66%
```

- Each time the ▲▼ Keys are pressed, the size increases or decreases in 1 mm increments. When pressed continuously the size goes up or down in 10 mm increments.
- Numbers can also be set using the Number Keys (0 to 9). The number flashes during setting.
  (1 mm = 0.03937 inch)

2. Press the ▶ Key to switch to the mode to specify the copy paper size.

- Press the ◀ Key to return to the mode for designating the paper size.

3. Press the ▲▼ Keys to specify the copy paper size.



```
* 2:ZOOM PROGRAM
ORIGINAL   COPY     RATIO
SIZE       SIZE
 150mm ▶  250mm     166%
```

- The size of the original can be changed anywhere between 50%~400%. If the set copy size makes the ratio outside this range, "50%" or "400%" will flash on the message Display.

4. Press the OK Key after setting is completed.

Registering Frequently Used Copy Modes

You can register and recall up to three optional copy mode combinations including the number of copies, zoom ratio and color mode.

MODE MEMORY REGISTRATION

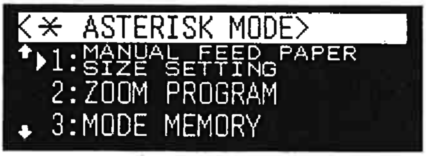
To Register

Set the Mode to be Registered

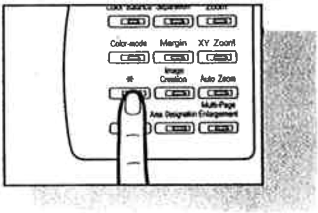
Set the copy mode to be registered in the mode memory (Number of Copies, Zoom Ratio, Color Mode, etc.)

Selecting "Mode Memory Registration"

1. Press the ⊠ (Asterisk) Key.
   The following message is displayed.



```
<* ASTERISK MODE>
↑▶1:MANUAL FEED PAPER
    SIZE SETTING
  2:ZOOM PROGRAM
↓ 3:MODE MEMORY
```

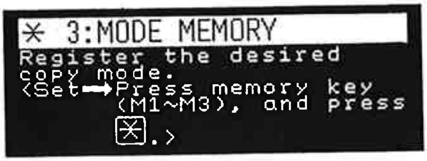

Color-mode
Margin
XY Zoom
*
Image Creation
Auto Zoom
Area Designation
Multi-Page Enlargement

2. Press the ▲▼ Keys to select 3 (Mode Memory) using the ▲▼ Keys. Then press the OK or ⊠ Keys.

- You can also select "Mode Memory Registration" by pressing Number Key 3.

Register the Copy Mode

Press the Memory Key you want to register the mode in (Either M1, M2 or M3). Then press the ☒ (Asterisk) Key.



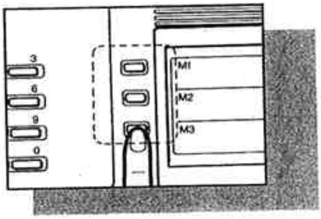
✻ 3:MODE MEMORY
Register the desired
copy mode.
<Set→Press memory key
(M1~M3), and press
☒.>

- If a new mode is registered in a mode memory that already contained a copy mode, the previous copy mode will be deleted.
- The memory information will not be lost even if the power is cut off.

■To Recall the Mode Memory

Recall the Mode Memory

Press the Memory Key which contains the copy mode you wish to recall. (Either M1, M2 or M3). The memorized copy mode will be displayed.



- You can change a part of the recalled copy mode. When you do so, the previous memory will not be cancelled unless you register the change.
- When a memorized copy mode is recalled, the copy mode set up to that point will be cancelled and the recalled copy mode will be registered.
- The modes stored in each of the memories can be written down on the labels beside each Key.

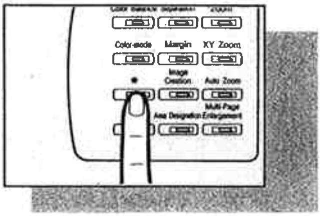
Copy Without Losing the Perimeter of the Original

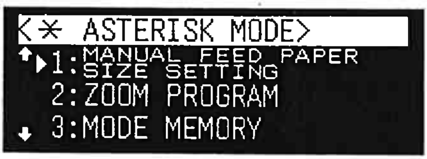
Copy without losing the perimeter of the image by automatically reducing the image slightly.

ENTIRE IMAGE COPY

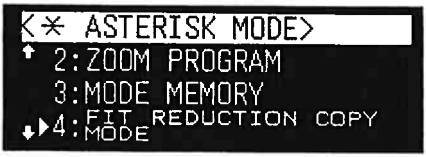
Select "FIT REDUCTION COPY MODE"

1. Press the ✳ (Asterisk) Key.
   The following message is displayed.




<❋ ASTERISK MODE>
↑▶1:MANUAL FEED PAPER SIZE SETTING
2:ZOOM PROGRAM
↓ 3:MODE MEMORY

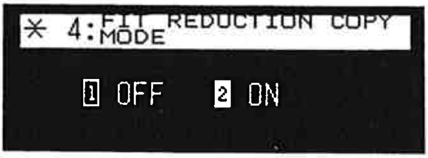
2. Select 4 (Fit reduction copy mode) using the ▲ ▼ Keys then press the OK or ✳ Keys.


<❋ ASTERISK MODE>
↑ 2:ZOOM PROGRAM
3:MODE MEMORY
↓▶4:FIT REDUCTION COPY MODE

- If you continuously press ▼, the items after 4 will be displayed.
- You can also select "Fit Reduction Copy Mode" by pressing Number Key 4.

Select ON/OFF

3. Press the ▲▼ Keys to select ON or OFF.
   Then press the OK Key.


❋ 4:FIT REDUCTION COPY MODE
1 OFF 2 ON

- When the "Fit Reduction Copy Mode" is ON, the zoom ratio indicated on the message display and the actual zoom ratio are different. 100% displayed, but the actual ratios are:
  11" x 17":97.6%, LGL: 97.1%
  LTR:95.3%, LTR-R;96.4%
- The Entire Image Copy Mode will be OFF in the following cases.
  - When the Automatic Clear Function is operating
  - When the Reset Key has been pressed.

Changing the Standard Mode

The mode displayed when the power is turned on or when the reset Key is pressed can be changed.

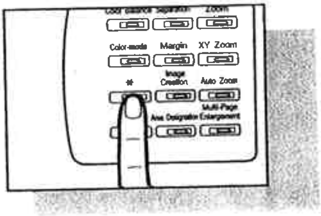
STANDARD MODE CHANGE

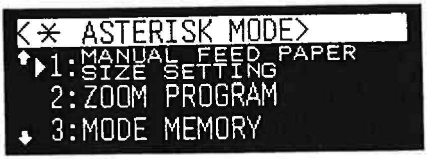
Set the Registered Standard Mode

Set the copy mode (number of sheets, zoom ratio, color mode, etc.) you want to register as the Standard Mode.

Select "Standard Mode Change"

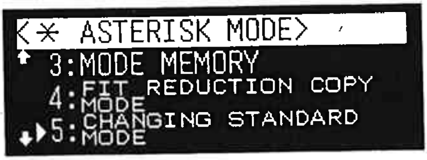
1. Press the asterisk ✱ Key
   The following message will be displayed.




<✱ ASTERISK MODE>
↑▶1:MANUAL FEED PAPER SIZE SETTING
2:ZOOM PROGRAM
↓ 3:MODE MEMORY

2. Press the ▲▼ Key to select 5 (Changing Standard Mode). Then press the OK Key or the ✱ Key.

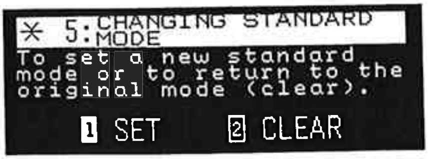
- When ▼ is continuously pressed, items following 4 will be displayed.
- You can also select the "Standard Mode Change" by pressing Number Key 5.


<✱ ASTERISK MODE>
↑ 3:MODE MEMORY
4:FIT REDUCTION COPY MODE
↓▶5:CHANGING STANDARD MODE

Register the Mode

Press the ◀▶ Keys to select 1 (Set). Then press OK.

- To return the original standard mode (shown on page 26), select 2 (CLEAR).


✱ 5:CHANGING STANDARD MODE
To set a new standard mode or to return to the original mode (clear).
1 SET 2 CLEAR

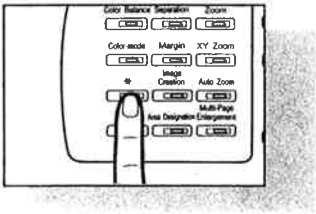
Controlling the Processing Priority between the Characters and Photos

This mode controls whether the character or the photo has copy priority. This function allows you to make optimum copies.

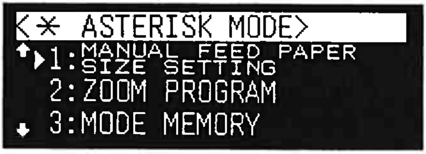
CHARACTER/PHOTO PRIORITY LEVEL CONTROL

Select "Character/Photo Priority Level Control"

1. Press the ⊠ (Asterisk) Key.
   The following message will be displayed.



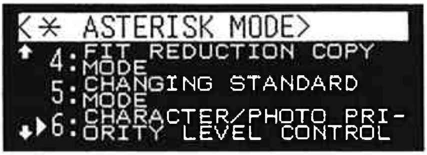
Color Balance
Separation
Zoom
Color-mode
Margin
XY Zoom
Image Creation
*
Auto Zoom
Area Designation
Multi-Page Enlargement



```
<* ASTERISK MODE>
↑▶1:MANUAL FEED PAPER
    SIZE SETTING
  2:ZOOM PROGRAM
↓ 3:MODE MEMORY
```

2. Press the ▲▼ Keys to select 6 (Character/Photo Proirity Level Control). Then press the ⊠ Key.

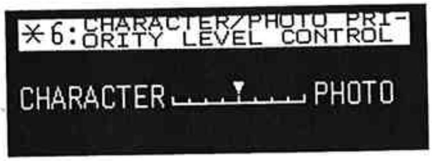
- When ▼ is continuously pressed, the items following 4 will be displayed.
- You can also select the "Character/Photo Priority Level Control" by pressing Number Key 6.



```
<* ASTERISK MODE>
↑ 4:FIT REDUCTION COPY
    MODE
  5:CHANGING STANDARD
    MODE
↓▶6:CHARACTER/PHOTO PRI-
    ORITY LEVEL CONTROL
```

Controlling the Priority Level

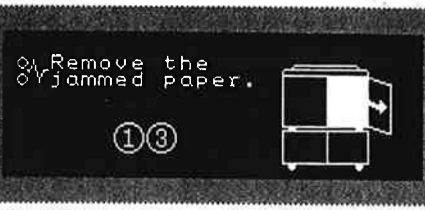
1. Press the ◀▶ Keys to control the position of the ▼ on the message display. To make more distinct copies of fine or faint characters
   → Shift the ▼ toward "Character"
   To make clearer photos
   → Shift the ▼ toward "Photo"



```
✻6:CHARACTER/PHOTO PRI-
   ORITY LEVEL CONTROL

CHARACTER ‿‿‿‿▼‿‿‿‿ PHOTO
```

2. Press the OK Key when the setting is completed.

Removing Jammed Copy Paper

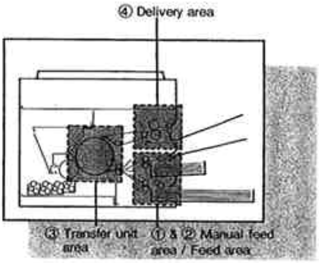


Remove the jammed paper.

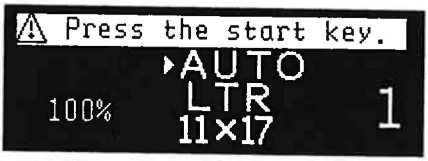
①③

If this message is displayed , paper is jammed in the machine. Open the front doors, check the area indicated by the lighted display and completely remove any jammed paper.

The number displayed on the message display indicates the locations shown at the right.



After clearing the jammed paper, if the following message appears on the display, press the Start Key and the remaining copies will be made.



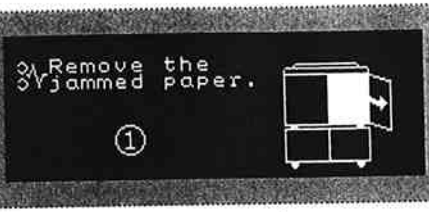
⚠ Press the start key.
▸AUTO
100%
LTR
11×17
1

- The Copy Mode cannot be changed while this message is displayed. To stop copying, press the Clear/Stop Key or the Reset Key.

- There is no need to reset the number of copies.

- Just after clearing jammed paper, copies with unclear colors may sometimes be produced.

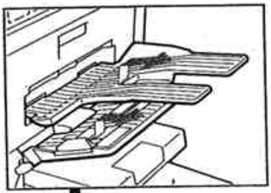
① Manual feed Area



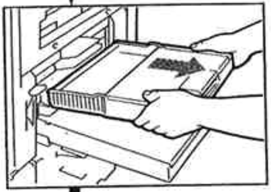
Remove the jammed paper.

①

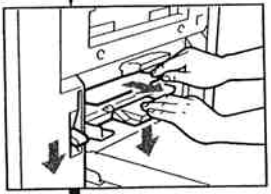
If there is a paper jam in the manual feed area, this message will be displayed.



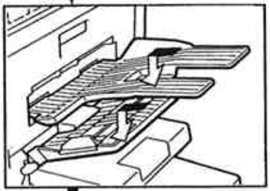
Remove the Copy Receiving Tray and the Manual Feed Tray.



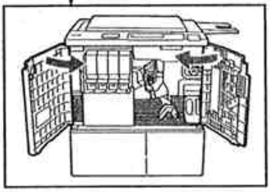
Remove the Upper Cassette using both hands.



Push the Manual Feed Lever downward.
Press the supply slot down, as you remove jammed paper from the supply slot without tearing it.
Paper may have worked its way into the back, so inspect the back area of the supply slot.

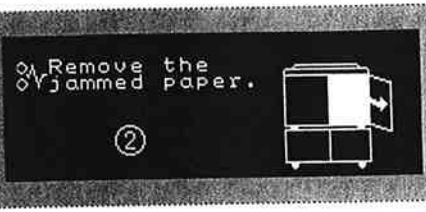


Replace the Cassette, Manual Feed Tray and Copy Receiving Tray to their original positions.



Open the front doors, then close them.

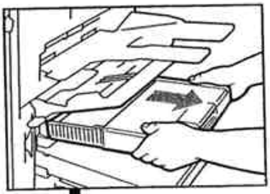
② Feed Area



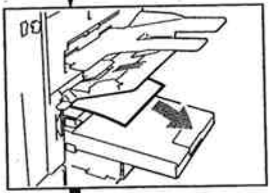
Remove the jammed paper.

②

If there is a paper jam in the feed area, this message will be displayed.

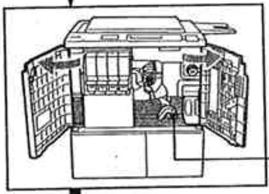


Remove the cassette that was in use using both hands.

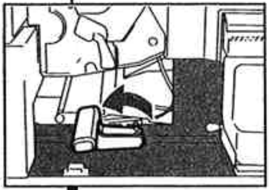


Inspect the Cassette and Feed Area

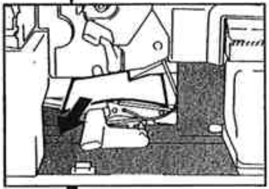
- ◆ Remove any paper protruding from the Cassette.
- ◆ Remove any paper jammed in the paper feed area, without tearing it.



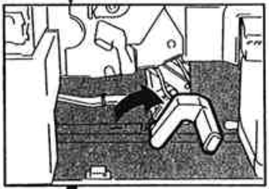
Open the front door.



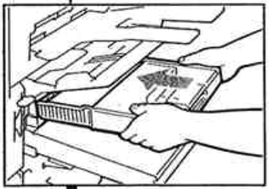
Pull down the Feeder Unit Release Lever and release the lock.



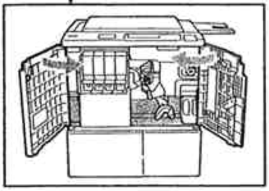
Slowly remove jammed paper, without tearing it.



Return the Feeder Unit Release Lever to its original position. It is locked in place when you hear a click.

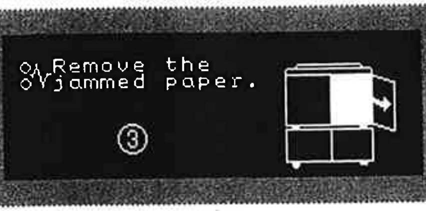


Holding the Cassette in both hands, return it to its original position.



Gently close the front doors.

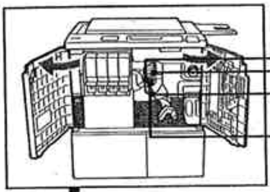
③ Transfer Unit Area



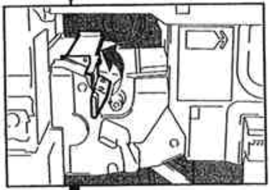
Remove the jammed paper.

③

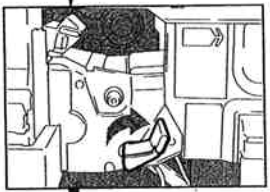
If there is a paper jam in the transfer unit area, this message will be displayed.


Separation Unit Release Lever
Transfer Drum
Transfer Unit Release Lever
Transfer Drum Rotation Knob

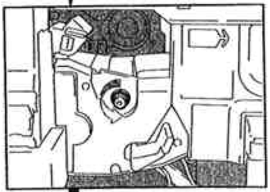
Open the front door.



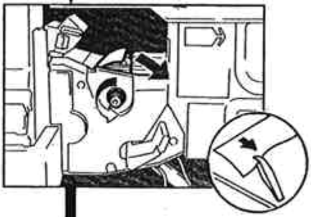
Raise the Separation Unit Release Lever to the upper left as far as it will go.



Lower the Transfer Unit Release Lever to the right and release the lock.

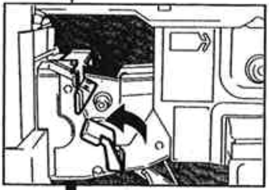


Rotate the Transfer Drum Rotation Knob to the position where the front edge of the paper on the Transfer Drum can be seen.

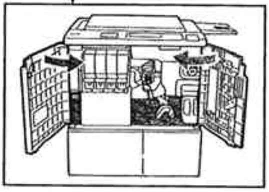


Clip the tip of the paper with the attached tongue. While rotating the knob, peel the paper off the drum little by little.

- ◆ If the paper should tear, be sure to remove all the remaining pieces.
- ◆ Avoid touching the transparent Transfer drum area.
- ◆ Be careful not to scratch or dent the transfer Drum.

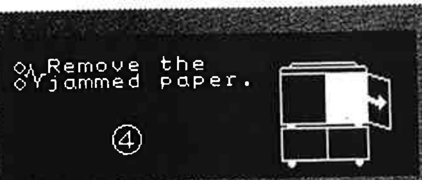


Return the Transfer Unit Release Lever and then the Separation Unit Release Lever to their original positions. The Transfer Unit Release Lever will click when locked in place.



Gently close the front doors.

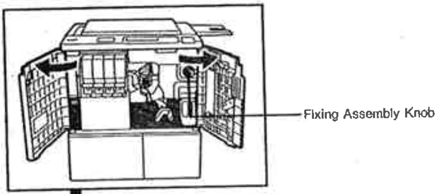
④ Delivery Area



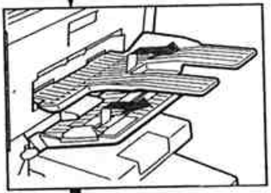
Remove the jammed paper.

④

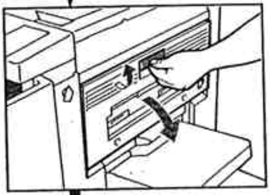
If there is a paper jam in the Delivery Area, this message will be displayed.



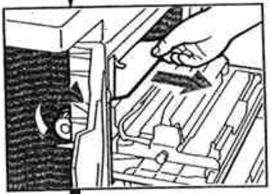
Open the front doors.



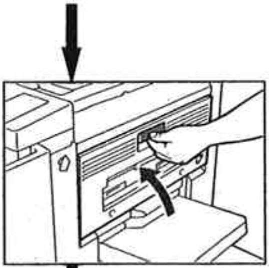
Remove the Copy Receiving Tray and the Manual Feed Tray.



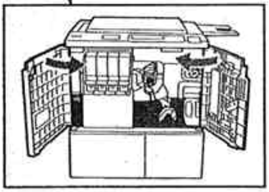
Pull the Delivery area release handle and open the delivery doors.



Remove jammed paper by turning the Fixing Assembly Knob.
The Fixing and Delivery Areas may be hot. Be careful to touch only the knob.

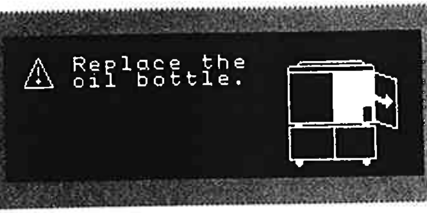


Close the Delivery Door. You will hear it click. Finally, replace the Manual Feed Tray and Copy Receiving Tray.



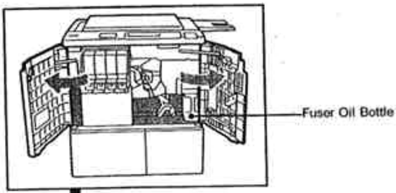
Gently close the front doors.

Replacing Fuser Oil

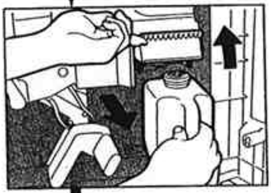


⚠ Replace the oil bottle.

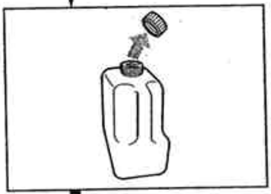
If this message is displayed, the Fuser Oil is low. Replace the Fuser Oil using the following procedure.



Open the front doors.

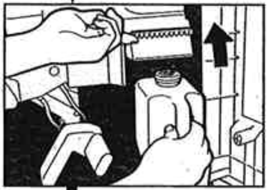


Lift the Fuser Oil Bottle Fixing Lever as you remove the old Fuser Oil Bottle (as shown).



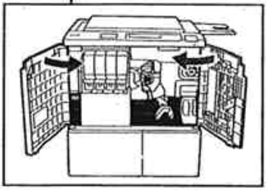
Remove the cap of the new Fuser Oil Bottle.

Fasten the removed cap onto the old Fuser Oil Bottle.



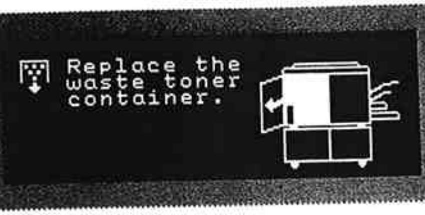
Lift the Fuser Oil Bottle Fixing Lever as you insert the new Fuser Oil Bottle.

- Store the removed oil bottle until the next service inspection.



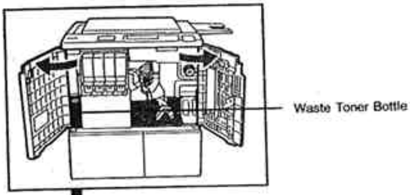
Gently close the front doors.

Removing Waste Toner

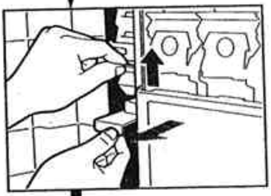


Replace the waste toner container.

If this message is displayed, the Waste Toner Bottle is full. Replace the Waste Toner Bottle using the following procedure.

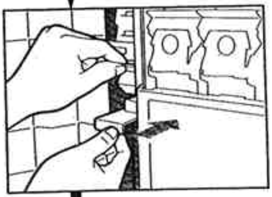


Open the front doors.



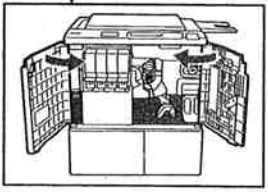
Lift the Waste Toner Bottle Fixing Lever as you pull the full Waste Toner Bottle straight out.

◆Place the seal of the new bottle on the full bottle. Store it until the next service inspection.



1. Prepare the new Waste Toner Bottle according to the directions on the bottle.

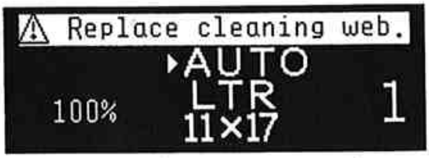
2. Lift the Waste Toner Bottle Fixing Lever as you insert the new Waste Toner Bottle.



Gently close the front doors.

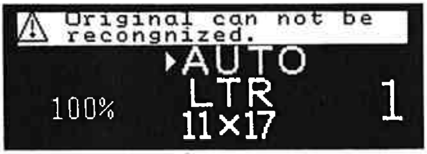
Self-Diagnosis Displays

Self-Diagnosis Displays are messages that tell the operator to take some action so copies can be made.
They are displayed in the following cases:
1) An operating error has occured, 2) The necessary conditions for copying have not been met, or 3) The operator must make a decision or take some action during a copy run.
Follow the instructions displayed. Only the messages that require special explanation are shown below.



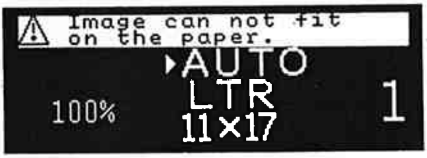
⚠ Replace cleaning web.

Copying can be continued for a while. Contact your service representative.



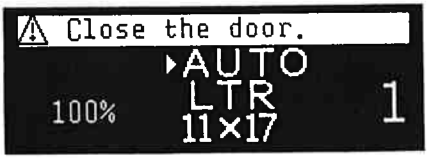
⚠ Original can not be recongnized.

Check that the original has been set on the copyboard. If the original cannot be recognized by Original Recognition, turn Original Recognition OFF.



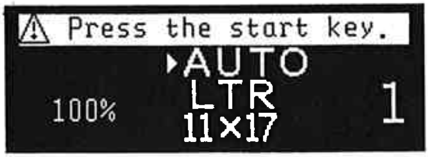
⚠ Image can not fit on the paper.

When copying with the specified zoom ratio, the picture cannot fit on the copy paper.



⚠ Close the door.

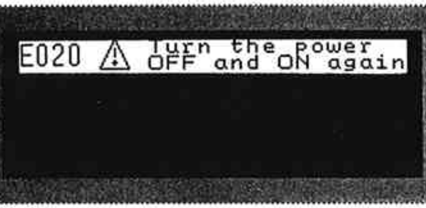
Either the right front door, the left front door, or the delivery door is open. Close the door.



⚠ Press the start key.

An error that occurred during copying has been corrected and the copy machine is ready to copy the remaining number of copies.
Press the Start Key to resume copying.
The copy mode cannot be changed.
Press the C/⊘ Key or the Reset Key to stop copying.

Error Displays



E020 ⚠ Turn the power OFF and ON again

If the copy machine cannot operate normally, an error message will be displayed.

Turn the Power Switch OFF and ON again.
If the machine still does not operate, turn the Power Switch OFF, unplug the machine and contact your service representative.

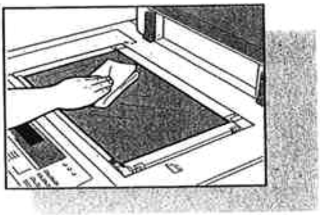
- If the copy machine operates after the Power Switch was turned OFF and ON, the colors may not be so distinct.

Cleaning

You should clean the following areas about once a week, or when clear copies are not made.

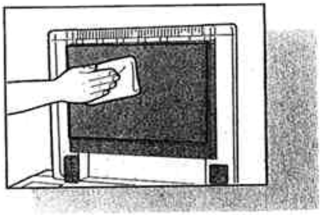
Copyboard Glass

Wipe the Copyboard Glass with a cloth dampened with water or a mild cleaning agent. Then wipe completely dry.



Copyboard Cover

Wipe the inside of the Copyboard Cover with a cloth dampened with water or a mild cleaning agent. Then wipe completely dry.



- Be careful not to scratch the cover.

CHAPTER 2

COPYING PROCESS

I. IMAGE FORMATION 2-1
  A. Outline 2-1
  B. Formation of Electrostatic Latent Image 2-3
  C. Pre-Conditioning Exposure (step 1) 2-4
  D. Primary Corona Exposure (step 2) 2-4
  E. Image Exposure (step 3) 2-5
  F. Development (step 4) 2-5
  G. Attraction (step 5) 2-6
  H. Transfer (step 6) 2-7
  I. Separation (step 7) 2-7
  J. Drum Cleaning (photosensitive drum; step 8) 2-8
  K. Fixing (step 9) 2-8
II. AUXILIARY PROCESSE 2-9
  A. Static Eliminator 2-9
  B. Pre-Cleaning Corona Unit .. 2-9
  C. Ozone Filter 2-9
III. LIMITATIONS 2-10
  A. Outline 2-10
  B. Characteristics 2-10

I. IMAGE FORMATION

A. Outline

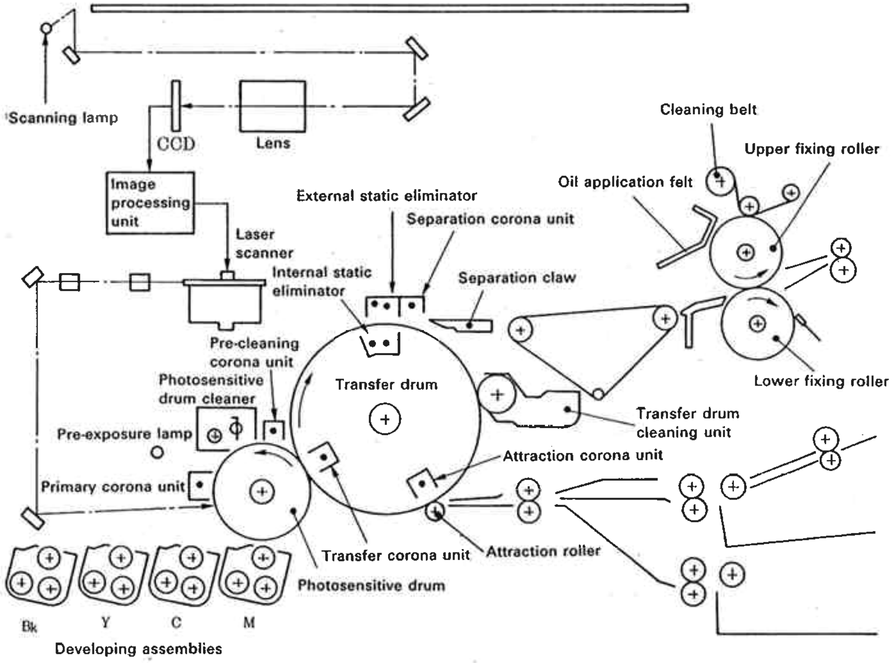

Scanning lamp
CCD
Lens
Image processing unit
Laser scanner
External static eliminator
Separation corona unit
Internal static eliminator
Separation claw
Cleaning belt
Upper fixing roller
Oil application felt
Lower fixing roller
Pre-cleaning corona unit
Photosensitive drum cleaner
Transfer drum
Transfer drum cleaning unit
Pre-exposure lamp
Attraction corona unit
Primary corona unit
Transfer corona unit
Attraction roller
Photosensitive drum
Bk
Y
C
M
Developing assemblies

Figure 2-1

The CLC200/300/350 is an electrophotographic copying machine equipped with a photosensitive drum. See Figure 2-1 for its construction.

The photosensitive drum is of a seamless type and of a two-layer construction; its outer layer is made of organic photoconductor (OPC), and the inner layer is an aluminum base made of conducting material.

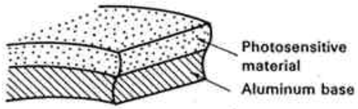

Photosensitive material
Aluminum base

Figure 2-2

The CLC200/300/350 differs from black/white copying machines in the following respects:

When a color document is set, the CLC200/300/350 illuminates the document, and the reflected light is separated by means of filters into its three primary colors for reception by a CCD.

Based on the data generated by the CCD, laser beams are scanned over a photosensitive drum for later development and transfer of each color (toner of the color complementary to that of each filter) on paper.

The process is repeated a maximum of four times, and a color copy is obtained when different toners are fixed on the paper.

To enable the mechanism, the CLC200/300/350 is equipped with a transfer drum, which keeps the paper in place while all transfer operations take place.

The transfer drum is twice the size of the photosensitive drum; for this reason, the photosensitive drum rotates twice while the transfer drum makes a single rotation. Images are formed in the following nine steps:

Step 1	Pre-conditioning exposure
Step 2	Primary corona exposure (negative DC)
Step 3	Image exposure (laser)
Step 4	Development (AC and DC bias)
Step 5	Attraction corona exposure (positive)
Step 6	Transfer corona exposure (positive)
Step 7	Separation corona exposure (AC)
Step 8	Cleaning
Step 9	Fixing

Figure 2-3 is a sequential diagram showing how the steps involved in the formation of images are related to each other.

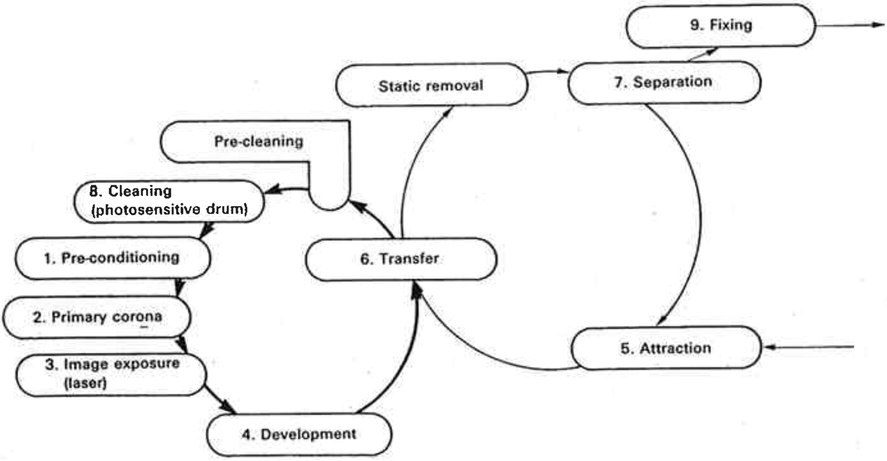

9. Fixing
Static removal
7. Separation
Pre-cleaning
8. Cleaning (photosensitive drum)
1. Pre-conditioning
6. Transfer
2. Primary corona
5. Attraction
3. Image exposure (laser)
4. Development

Figure 2-3

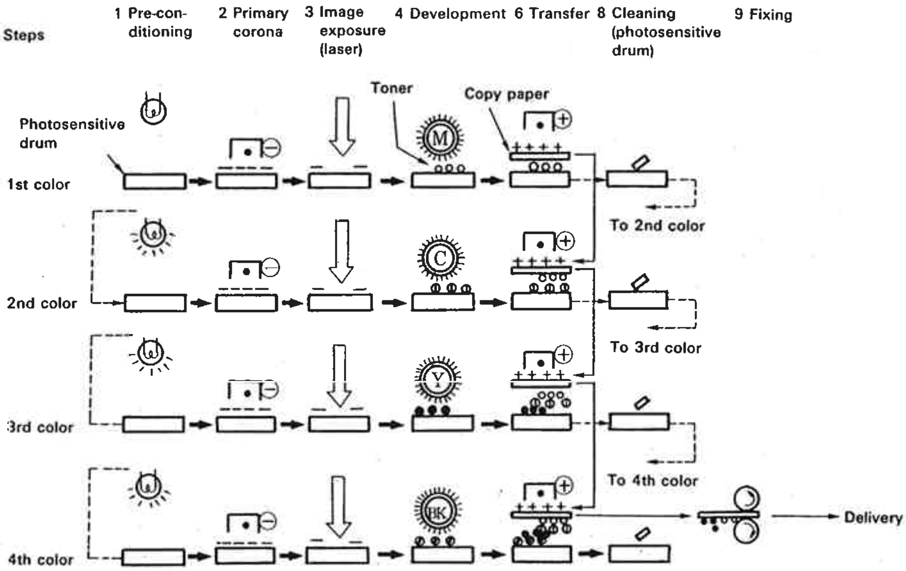

Steps
1 Pre-conditioning
2 Primary corona
3 Image exposure (laser)
4 Development
6 Transfer
8 Cleaning (photosensitive drum)
9 Fixing
Photosensitive drum
Toner
Copy paper
1st color
2nd color
3rd color
4th color
M
C
Y
BK
To 2nd color
To 3rd color
To 4th color
Delivery

Figure 2-4

B. Formation of Electrostatic Latent Image

This block consists of the first three steps of the image formation process; at its end, the areas of the drum corresponding to light areas of the document are left with negative charges, and those representing dark areas are rid of negative charges.

The pattern of charges so formed is not visible to the human eye and, therefore, is called an *electrostatic latent image.*

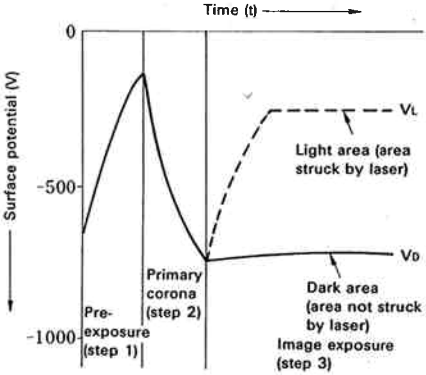


Figure 2-5

C. Pre-Conditioning Exposure (step 1)

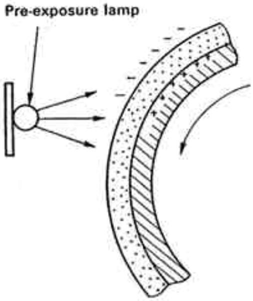


Figure 2-6

In this step, or pre-conditioning exposure, the surface of the drum is exposed to light from the pre-conditioning exposure lamp. All charges remaining on the surface of the drum from the preceding copy cycle are eliminated in preparation for exposure by the primary corona. Such charges, if left as they are, could result in copies with uneven density.

D. Primary Corona Exposure (step 2)

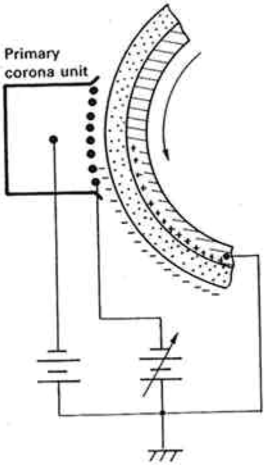


Figure 2-7

In this step, the drum is exposed by the primary corona. As a result, its surface will come to have a uniform layer of negative charges and maintain primary potential.

The surface potential of the drum is determined by the potential of the grid and, therefore, the grid is given a bias to maintain a constant potential.

E. Image Exposure (step 3)

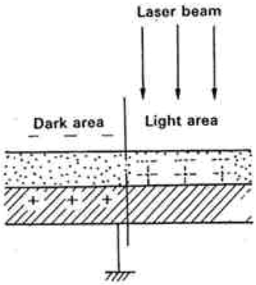


Figure 2-8

The laser light is directed on the drum surface. The light neutralize the charges to suit the dark areas of the document. The areas so created are called the light areas of the photosensitive drum; these areas will attract toner in the development process (step 4).

F. Development (step 4)

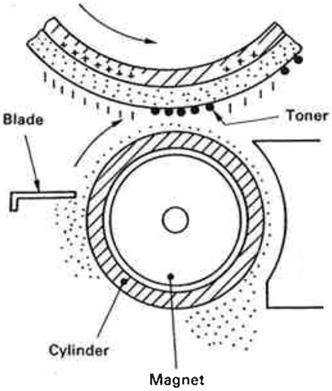


Figure 2-9

In this process, the electrostatic potential image on the drum surface is turned into a visible image by application of toner.

In the CLC200/300/350, the toner is charged to a negative potential (same polarity as by primary corona) so that it is attracted to the light areas of the drum surface exposed by laser beams.

As shown in Figure 2-9, the developing assembly consists of a developing cylinder and a magnetic blade; the developing cylinder itself is made up of a magnet fixed in position and a cylinder which rotates around the magnet.

The developer consists of toner (resin and color pigment) and carrier (magnetite) mixed at a fixed ratio. By friction against the rotating cylinder, the toner is charged to a negative potential and the carrier, to a positive potential.

A concentrated magnetic field develops between the magnet and the tip of the blade, and the developer is attracted to the magnetic field. The magnetic field holds the developer it has attracted virtually immobile and creates a uniform layer of developer particles by the tip of the blade.

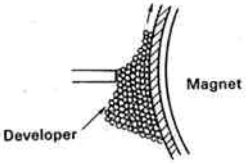


Figure 2-10

Since the developing cylinder is given an AC bias and DC bias (negative component) during copy runs, the resulting wave form of the developing bias has a larger negative component than positive.

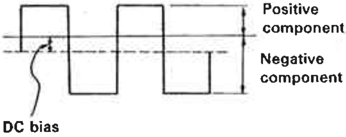


Figure 2-11

During copy operation, the toner is attracted to the drum by the work of the surface potential of the photosensitive drum as well as the negative component of the developing bias and turns the electrostatic latent image to a visible image. The excess toner is repelled by the positive component of the developing bias and the surface potential of the drum.

G. Attraction (step 5)

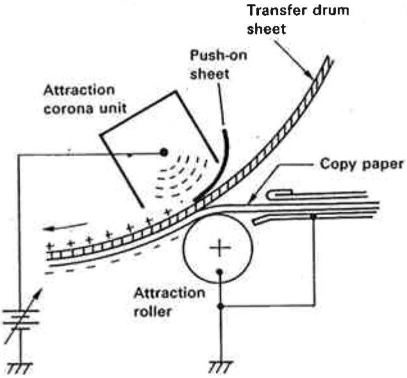


Figure 2-12

The transfer drum of the CLC200/300/350 does not have a gripper; the work of the gripper is taken care of by what is called static attraction, in which the copy paper fed forward through the registration roller is attracted to the transfer drum sheet and retained over it by means of static electricity.

The attraction corona unit and attraction roller are located at a point where the copy paper comes into the transfer drum. The attraction corona unit generates a positive corona to apply a positive charge on the back of the transfer drum sheet, and the attraction roller applies a negative charge on the face of the copy paper; and these opposite charges attract each other to retain the paper on the transfer drum sheet.

H. Transfer (step 6)

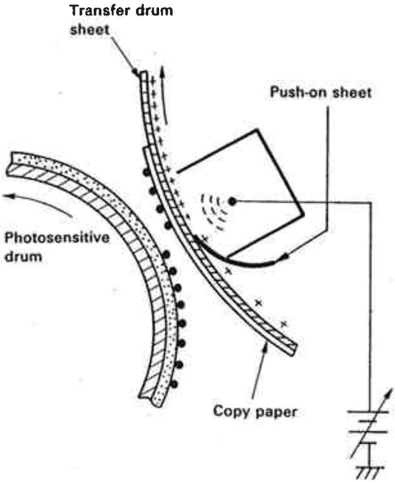

Transfer drum sheet
Push-on sheet
Photosensitive drum
Copy paper

Figure 2-13

In this step, a positive corona is applied to the back of the copy paper (inside the transfer drum) at which it comes into contact with the photosensitive drum so as to attract the toner to the paper from the photosensitive drum.

> **Note:**
> A plastic member shaped like a grid is located along the section over which the leading edge of an A-side copy comes into contact; a width of about 8 mm from the leading edge, for this reason, will not accept any image.

I. Separation (step 7)

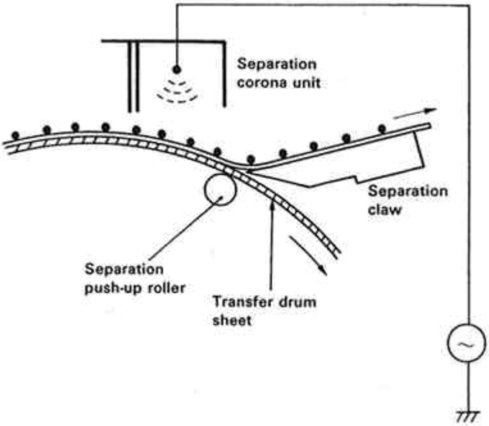

Separation corona unit
Separation claw
Separation push-up roller
Transfer drum sheet

Figure 2-14

In this step, the copy paper is separated from the drum by means of a separation claw and separation push-up roller. By way of facilitating the separation, an AC corona is applied by the separation corona unit to break down the electrostatic force between the paper and the transfer drum.

J. Drum Cleaning (photosensitive drum; step 8)

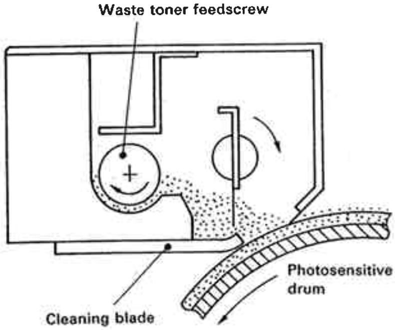

Waste toner feedscrew
Photosensitive drum
Cleaning blade

Figure 2-15

In this step, the toner remaining on the drum surface is scraped by the cleaning blade.

The scraped toner is forwarded by the waste toner feedscrew to the front and collected by the waste toner bottle.

K. Fixing (step 9)

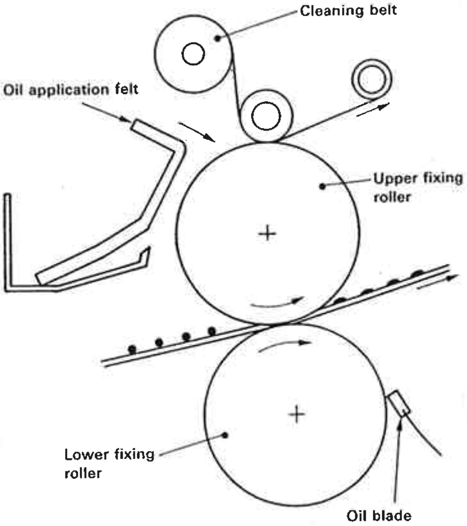

Cleaning belt
Oil application felt
Upper fixing roller
Lower fixing roller
Oil blade

Figure 2-16

After transfer of the image (toners) for a maximum of four times depending on the color mode selected, the copy paper is moved to the fixing assembly.

In this step, the paper carrying a transfer image moves between two heated rollers, and the transfer image is fixed to the paper; at this time, the toners of four different colors are melted and mixed to produce respective colors.

To prevent toner offset (caused by toner on the fixing roller), the upper roller remains in contact with the cleaning belt impregnated with silicone oil; the take-up mechanism advances the point of contact on the cleaning belt, thereby cleaning the upper roller while applying the silicone oil. The oil blade also serves to clean the fixing roller.

II. AUXILIARY PROCESSES

A. Static Eliminator

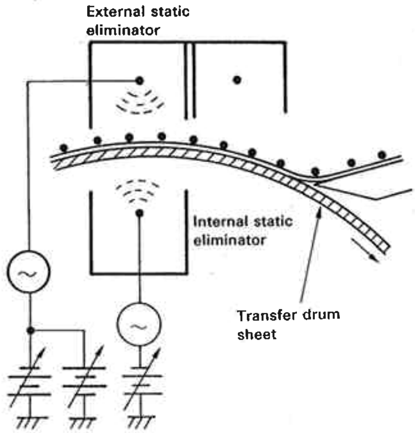

External static eliminator
Internal static eliminator
Transfer drum sheet

Figure 2-18 (CLC200)

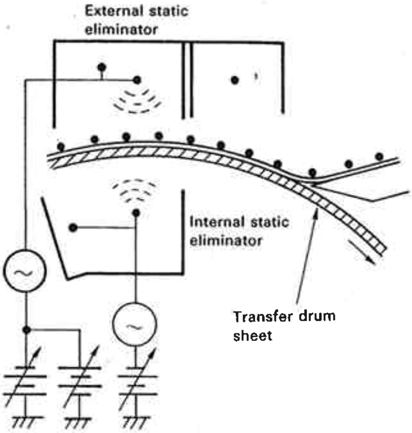

External static eliminator
Internal static eliminator
Transfer drum sheet

Figure 2-18a (CLC300/350)

The copy paper, after it has gone through the transfer process, carries electrical charge; to prevent the toner image from disintegrating because of the charge, two external static eliminators are provided to remove the charge by an AC corona with a DC bias.

B. Pre-Cleaning Corona Unit

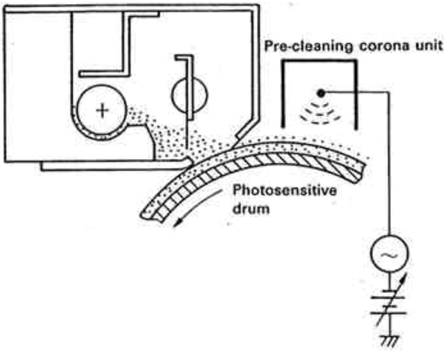

Pre-cleaning corona unit
+
Photosensitive drum

Figure 2-18

During a copy run, the DC component is turned ON at the trailing edge of the copy paper to prevent the formation of traces.

Likewise, the AC component is turned ON during a copy run to rid the surface of the photosensitive drum of charges.

C. Ozone Filter

The exhaust fan unit is equipped with three ozone filters, which break down the ozone generated by the coronas into oxygen by catalytic action.

III. LIMITATIONS

A. Outline

There are many difficulties in making high-quality color prints by an electrophotographic process, some of which are discussed below. The Color Laser Copier has many design features to minimize these difficulties, and they are very successful.

However, the prints are not of the same quality as those in high-quality printed material, such as magazine illustrations and photographs.

Each product has its own advantages and limitations, and users of the copying machine should be made aware of the capabilities of the machine.

B. Characteristics

1. OPC

The sensitivity of the OPC used for the photosensitive drum is subject to the environment in which the machine is used and changes over time.

2. Reflectance of Toner

The ideal toners, representing the primary colors (yellow, magenta, and cyan), should absorb 100 percent of the spectrum of their complementary colors and reflect 100 percent of the rest. Such toners, however, are not available at present.

3. Dry Electrostatic Photography and Gradation

As shown in Figure 2-19, it is impossible to reproduce the density of the original document exactly the same because of the characteristics of photosensitive material and toner.

The powder toner, further, limits the details of the image to the diameter of its individual particles.

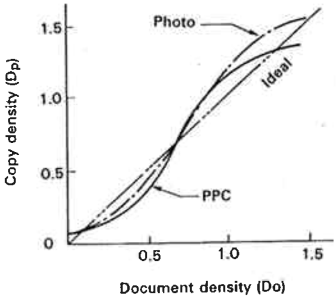


Figure 2-19

CHAPTER 3

OPERATIONS AND TIMING

In outline diagrams, ▬▬▬ represents mechanical drive paths, and ——►, where given, indicates electrical signal paths. The timing of operation is based on the following relationship:

Single rotation of transfer drum	5.98 sec
Single rotation of photosensitive drum	2.99 sec

Signals in digital circuits are identified as '1' for High and '0' for Low; the voltage of signals, however, depends on the circuit. *The asterisk (✻) as used in 'DRMD✻' indicates that the DRMD signal goes ON when it is '0'.*

Nearly all operations of the machine are controlled by microprocessors; the internal workings of these processors are not relevant to the serviceman's work and, therefore, are left out of the discussions–by the same token, no repairs are prescribed for the PCBs at the user's premises. For this reason, the PCBs are discussed by means of block diagrams rather than circuit diagrams.

For the purpose of explanation, discussions are divided into the following: from sensors to PCB input ports; from PCB output ports to loads; and minor control circuits and functions.

I. OUTLINE OF OPERATIONS ... 3-1
- A. Functional Construction 3-1
- B. Electrical Circuitry 3-2
- C. Inputs to and Outputs from Major PCBs 3-3
- D. Basic Sequence of Operations 3-16
- E. Generation of Image Leading Edge Signal 3-20
- F. Main Motor 3-23
- G. Drum Motor 3-24

II. EXPOSURE SYSTEM (Scanning lamp) 3-25
- A. Changing the Reproduction Ratios 3-25
- B. Basic Sequence of Operations (scanning lamp) 3-26
- C. Scanner Motor 3-28
- D. Scanning Lamp Control 3-29

III. IMAGE PROCESSING SYSTEM 3-30
- A. Outline 3-30
- B. CCD and CCD Driver 3-31
- C. Analog Image Processor PCB 3-32
- D. Digital Image Processor PCB 3-33

IV. EXPOSURE SYSTEM (laser) ... 3-47
- A. Outline 3-47
- B. Sequence of Operations 3-48
- C. Generation of BD Signal ... 3-49
- D. Laser Driver PCB 3-50
- E. Temperature Control for Laser Unit 3-51
- F. Laser Scanner Motor 3-52

V. IMAGE FORMATION SYSTEM 3-53
- A. Outline 3-53
- B. Sequence of Operations (image formation system) .. 3-54
- C. Image Stability Control 3-55
- D. Drum Surface Potential Control 3-56
- E. Drum Toner Concentration Control 3-62
- F. Primary Corona Current Control 3-66
- G. Attraction Corona Potential Control 3-67
- H. Transfer Corona Current Control 3-68
- I. Separation Corona Current Control 3-69
- J. Internal Static Eliminator Corona Current Control 3-70
- K. External Static Eliminator Corona Current Control 3-71
- L. Pre-Cleaning Corona Current Control 3-72
- M. Photosensitive Drum Temperature Control 3-73
- N. Primary Corona Wire Cleaning Control 3-74
- O. Developing Assembly/Photosensitive Drum Cleaning Unit 3-75

VI. PICK-UP AND FEEDER SYSTEM 3-93
- A. Outline 3-93
- B. Pick-up 3-94
- C. Transfer Drum 3-102
- D. Fixing Assembly and Delivery Unit 3-119
- E. Jam Detection 3-126
- F. Offset Tray 3-129

VII. CONTROL PANEL 3-131

VIII. IMAGE EDITING UNIT 3-132
- A. Outline 3-132
- B. Mechanism 3-132
- C. Zero-Adjustment for Input Coordinates 3-134

IX. FAN 3-135

X. POWER SUPPLY 3-137
- A. Power Supply 3-137
- B. Protection Mechanism for Power Supply Circuitry .. 3-137

XI. SERVICE MODE 3-141
- A. Outline 3-141
- B. Display Mode (DISPLAY) 3-143
- C. Adjustment Mode (ADJUST) 3-159
- D. Check Mode (FUNCTION) 3-174
- E. Options Mode (OPTION) 3-202
- F. Test Print Mode (TEST PRINT) 3-206
- G. Counter (COUNTER) 3-208
- H. Adjustments 3-209
- I. Test Prints 3-216

XII. SELF DIAGNOSIS 3-229

I. OUTLINE OF OPERATIONS

A. Functional Construction

The CLC200/300/350 can be divided into six functional blocks; i.e., pick-up/feed system, exposure system, image processing system, (laser) exposure system, image formation system, and control system.

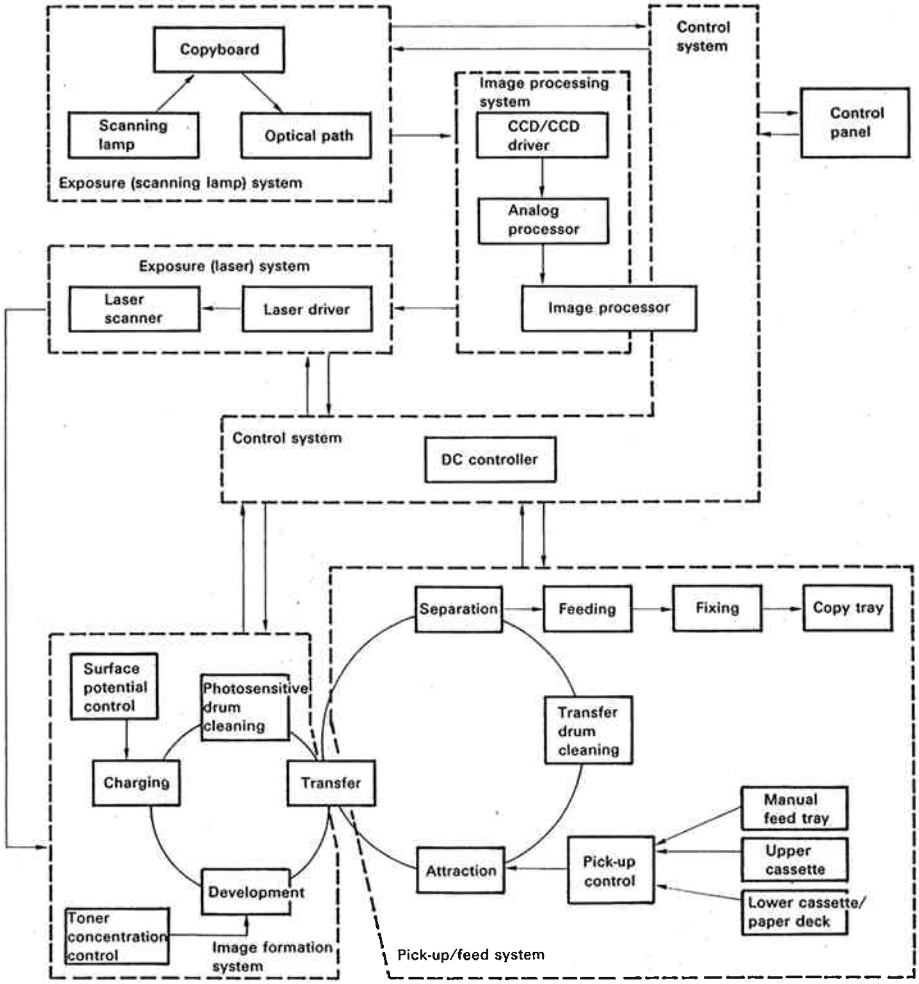

Copyboard
Scanning lamp
Optical path
Exposure (scanning lamp) system
Control system
Image processing system
CCD/CCD driver
Analog processor
Image processor
Control panel
Exposure (laser) system
Laser scanner
Laser driver
Control system
DC controller
Separation
Feeding
Fixing
Copy tray
Surface potential control
Photosensitive drum cleaning
Charging
Transfer
Transfer drum cleaning
Development
Toner concentration control
Image formation system
Attraction
Pick-up control
Manual feed tray
Upper cassette
Lower cassette/ paper deck
Pick-up/feed system

Figure 3-100

B. Electrical Circuitry

The image processor PCB and DC controller PCB of the CLC200/300/350 are each equipped with a microprocessor which controls the major electrical functions of the machine.

The RAM on the image processor is backed up by a lithium battery, and it retains not only the data needed by the image processor PCB but also those needed by the DC controller PCB.

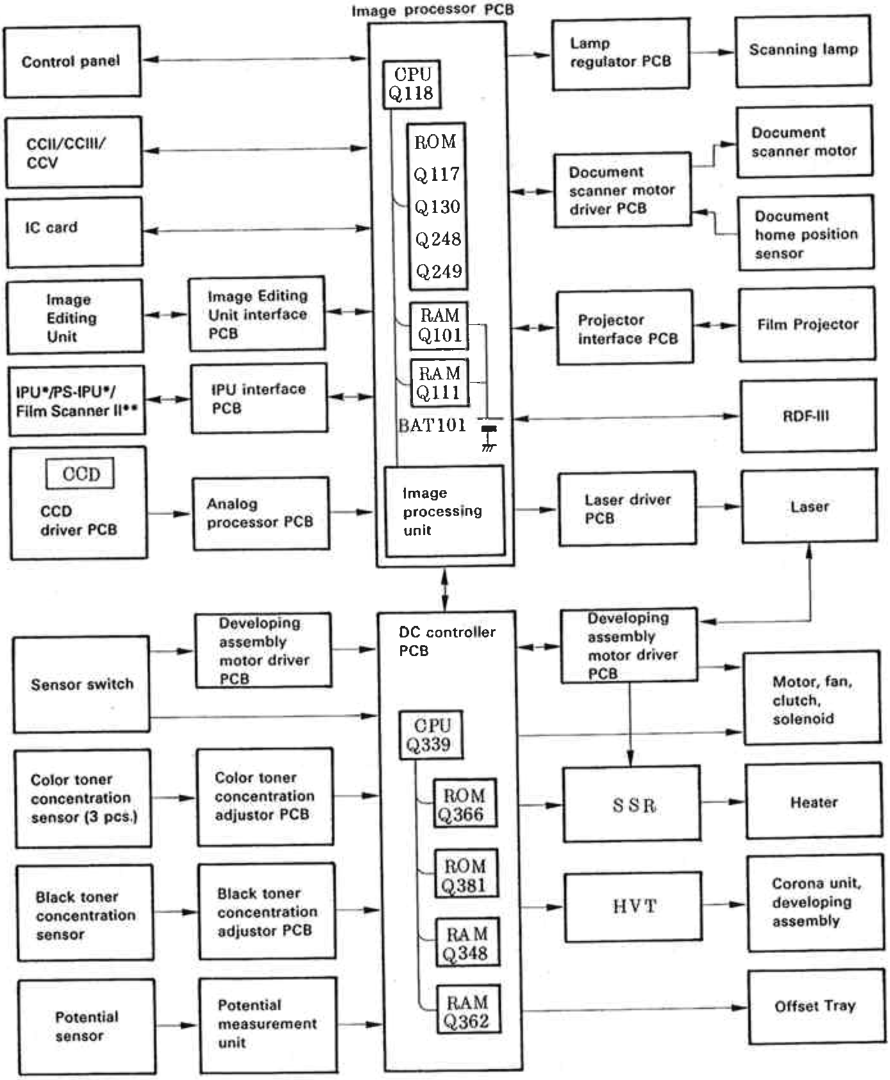


Image processor PCB
Control panel
CCII/CCIII/CCV
IC card
Image Editing Unit
Image Editing Unit interface PCB
IPU*/PS-IPU*/Film Scanner II**
IPU interface PCB
CCD
CCD driver PCB
Analog processor PCB
CPU Q118
ROM Q117 Q130 Q248 Q249
RAM Q101
RAM Q111
BAT101
Image processing unit
Lamp regulator PCB
Scanning lamp
Document scanner motor
Document scanner motor driver PCB
Document home position sensor
Projector interface PCB
Film Projector
RDF-III
Laser driver PCB
Laser
DC controller PCB
CPU Q339
ROM Q366
ROM Q381
RAM Q348
RAM Q362
Sensor switch
Developing assembly motor driver PCB
Color toner concentration sensor (3 pcs.)
Color toner concentration adjustor PCB
Black toner concentration sensor
Black toner concentration adjustor PCB
Potential sensor
Potential measurement unit
Developing assembly motor driver PCB
Motor, fan, clutch, solenoid
SSR
Heater
HVT
Corona unit, developing assembly
Offset Tray

* CLC300/350 only.
** CLC350 only.

Figure 3-101

C. Inputs to and Outputs from Major PCBs

Inputs to and Outputs from Image Processor (1/2)

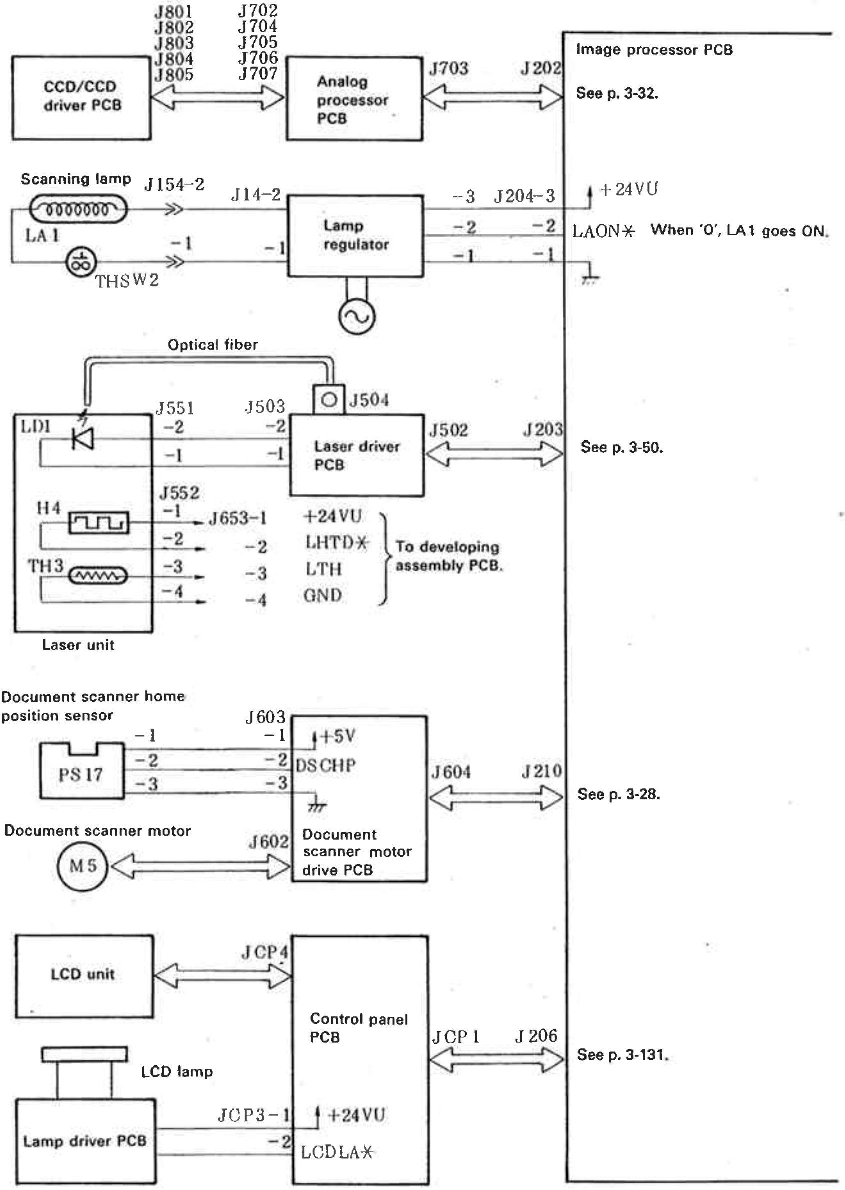

J801
J802
J803
J804
J805
J702
J704
J705
J706
J707
CCD/CCD driver PCB
Analog processor PCB
J703
J202
Image processor PCB
See p. 3-32.
Scanning lamp
J154-2
J14-2
LA1
-1
-1
THSW2
Lamp regulator
-3
J204-3
-2
-2
-1
-1
+24VU
LAON✱ When '0', LA1 goes ON.
Optical fiber
J504
J551
J503
LD1
-2
-2
-1
-1
Laser driver PCB
J502
J203
See p. 3-50.
J552
H4
-1
J653-1
-2
-2
TH3
-3
-3
-4
-4
+24VU
LHTD✱
LTH
GND
To developing assembly PCB.
Laser unit
Document scanner home position sensor
J603
PS17
-1
-1
-2
-2
-3
-3
+5V
DSCHP
J604
J210
See p. 3-28.
Document scanner motor
M5
J602
Document scanner motor drive PCB
LCD unit
JCP4
Control panel PCB
JCP1
J206
See p. 3-131.
LCD lamp
Lamp driver PCB
JCP3-1
-2
+24VU
LCDLA✱

Figure 3-102

Inputs to and Outputs from Image Processor (2/2)

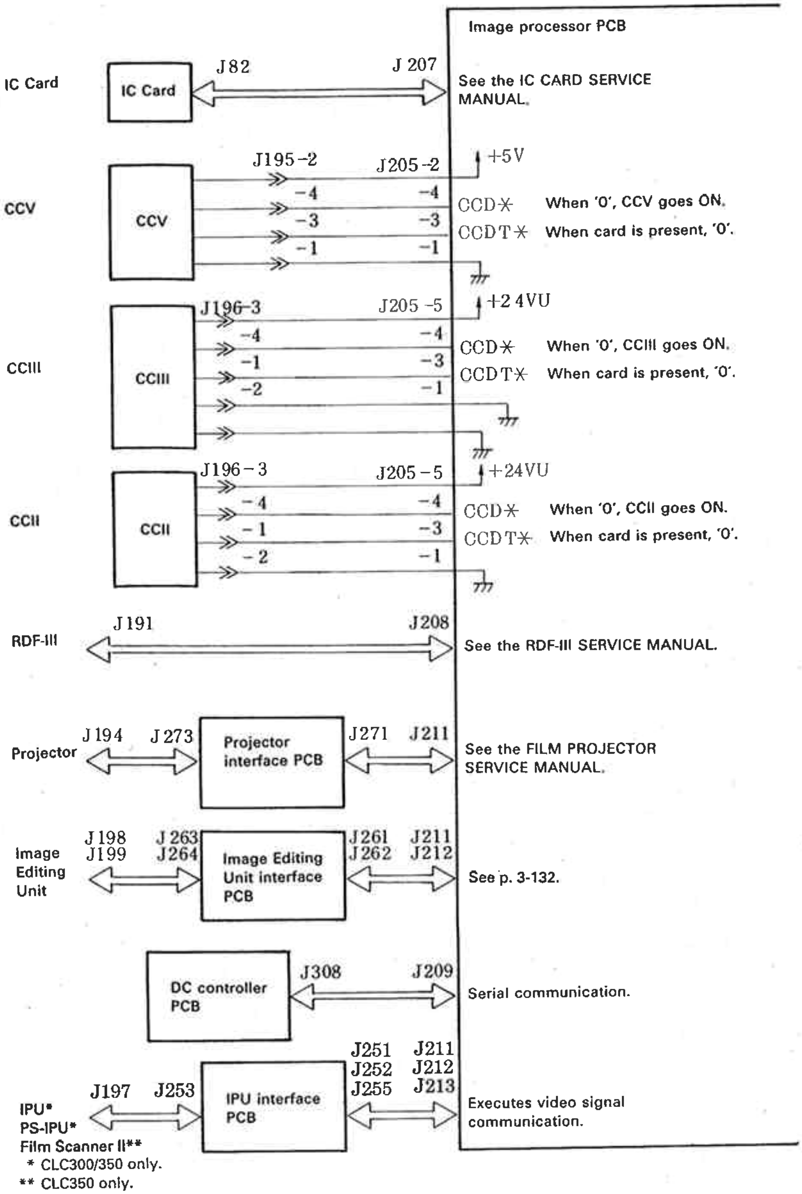
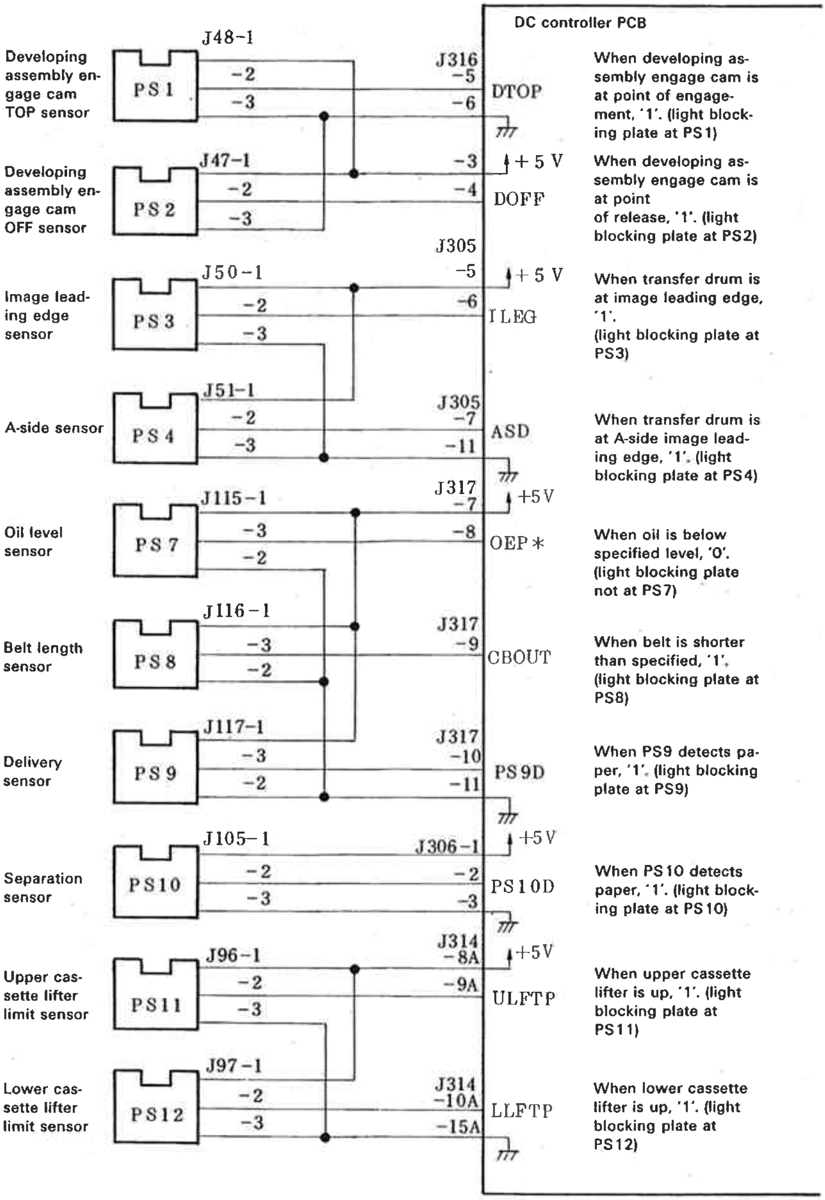


Image processor PCB
IC Card
IC Card
J82
J 207
See the IC CARD SERVICE MANUAL.
CCV
CCV
J195-2
J205-2
-4
-4
-3
-3
-1
-1
+5V
CCD✳ When '0', CCV goes ON.
CCDT✳ When card is present, '0'.
CCIII
CCIII
J196-3
J205 -5
-4
-4
-1
-3
-2
-1
+24VU
CCD✳ When '0', CCIII goes ON.
CCDT✳ When card is present, '0'.
CCII
CCII
J196-3
J205-5
-4
-4
-1
-3
-2
-1
+24VU
CCD✳ When '0', CCII goes ON.
CCDT✳ When card is present, '0'.
RDF-III
J191
J208
See the RDF-III SERVICE MANUAL.
Projector
J194
J273
Projector interface PCB
J271
J211
See the FILM PROJECTOR SERVICE MANUAL.
Image Editing Unit
J198
J199
J263
J264
Image Editing Unit interface PCB
J261
J262
J211
J212
See p. 3-132.
DC controller PCB
J308
J209
Serial communication.
IPU*
PS-IPU*
Film Scanner II**
* CLC300/350 only.
** CLC350 only.
J197
J253
IPU interface PCB
J251
J252
J255
J211
J212
J213
Executes video signal communication.

Figure 3-103

Inputs to DC Controller (1/4)


DC controller PCB
Developing assembly engage cam TOP sensor
PS1
J48-1
-2
-3
J316
-5
-6
DTOP
Developing assembly engage cam OFF sensor
PS2
J47-1
-2
-3
-3
+5 V
-4
DOFF
Image leading edge sensor
PS3
J50-1
-2
-3
J305
-5
+5 V
-6
ILEG
A-side sensor
PS4
J51-1
-2
-3
J305
-7
ASD
-11
Oil level sensor
PS7
J115-1
-3
-2
J317
-7
+5V
-8
OEP*
Belt length sensor
PS8
J116-1
-3
-2
J317
-9
CBOUT
Delivery sensor
PS9
J117-1
-3
-2
J317
-10
PS9D
-11
Separation sensor
PS10
J105-1
-2
-3
J306-1
+5V
-2
PS10D
-3
Upper cassette lifter limit sensor
PS11
J96-1
-2
-3
J314
-8A
+5V
-9A
ULFTP
Lower cassette lifter limit sensor
PS12
J97-1
-2
-3
J314
-10A
LLFTP
-15A

When developing assembly engage cam is at point of engagement, '1'. (light blocking plate at PS1)

When developing assembly engage cam is at point of release, '1'. (light blocking plate at PS2)

When transfer drum is at image leading edge, '1'. (light blocking plate at PS3)

When transfer drum is at A-side image leading edge, '1'. (light blocking plate at PS4)

When oil is below specified level, '0'. (light blocking plate not at PS7)

When belt is shorter than specified, '1'. (light blocking plate at PS8)

When PS9 detects paper, '1'. (light blocking plate at PS9)

When PS10 detects paper, '1'. (light blocking plate at PS10)

When upper cassette lifter is up, '1'. (light blocking plate at PS11)

When lower cassette lifter is up, '1'. (light blocking plate at PS12)

Figure 3-104

Inputs to DC Controller (2/4)

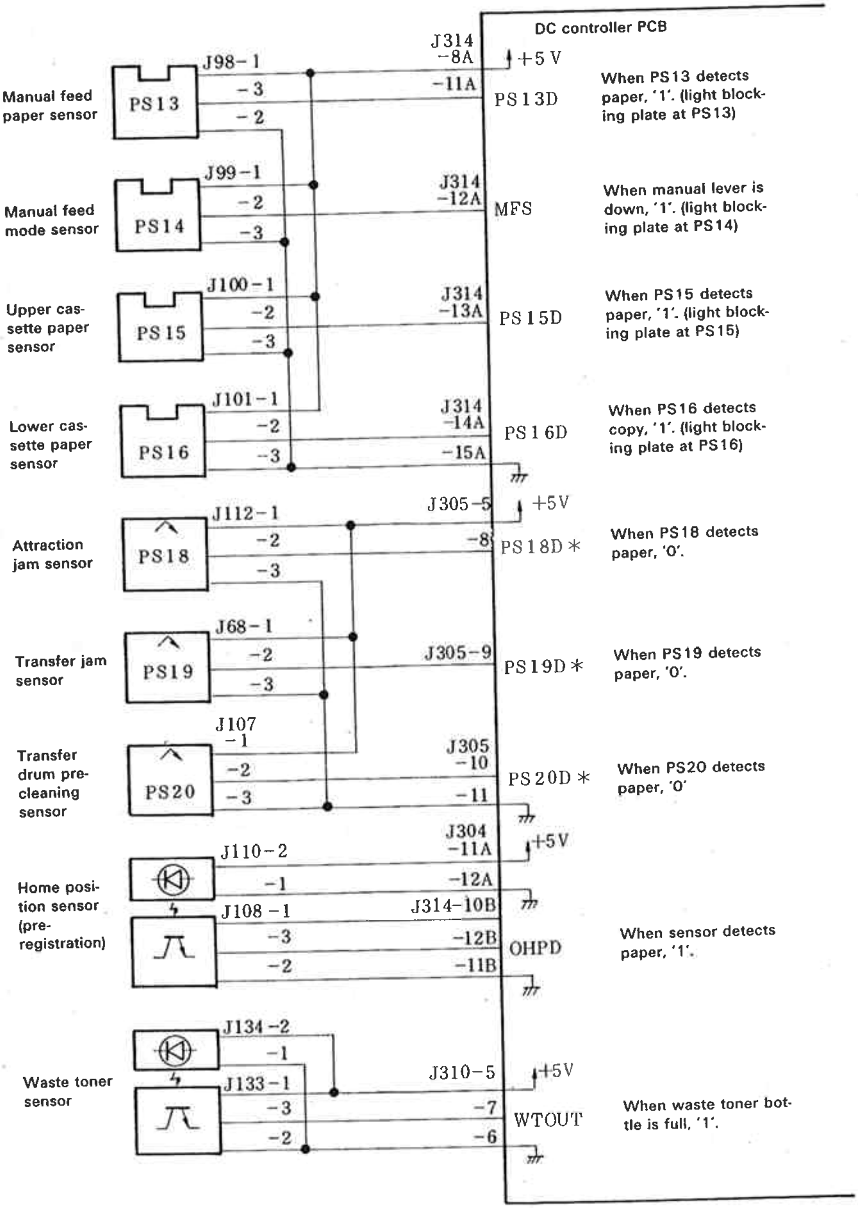

DC controller PCB
Manual feed paper sensor
PS13
J98-1
-3
-2
J314 -8A
+5 V
-11A
PS13D
When PS13 detects paper, '1'. (light blocking plate at PS13)
Manual feed mode sensor
PS14
J99-1
-2
-3
J314 -12A
MFS
When manual lever is down, '1'. (light blocking plate at PS14)
Upper cassette paper sensor
PS15
J100-1
-2
-3
J314 -13A
PS15D
When PS15 detects paper, '1'. (light blocking plate at PS15)
Lower cassette paper sensor
PS16
J101-1
-2
-3
J314 -14A
-15A
PS16D
When PS16 detects copy, '1'. (light blocking plate at PS16)
Attraction jam sensor
PS18
J112-1
-2
-3
J305-5
+5V
-8
PS18D*
When PS18 detects paper, '0'.
Transfer jam sensor
PS19
J68-1
-2
-3
J305-9
PS19D*
When PS19 detects paper, '0'.
Transfer drum pre-cleaning sensor
PS20
J107 -1
-2
-3
J305 -10
-11
PS20D*
When PS20 detects paper, '0'
Home position sensor (pre-registration)
J110-2
-1
J304 -11A
+5V
-12A
J108-1
-3
-2
J314-10B
-12B
-11B
OHPD
When sensor detects paper, '1'.
Waste toner sensor
J134-2
-1
J133-1
-3
-2
J310-5
+5V
-7
-6
WTOUT
When waste toner bottle is full, '1'.

Figure 3-105

Inputs to DC Controller (3/4)

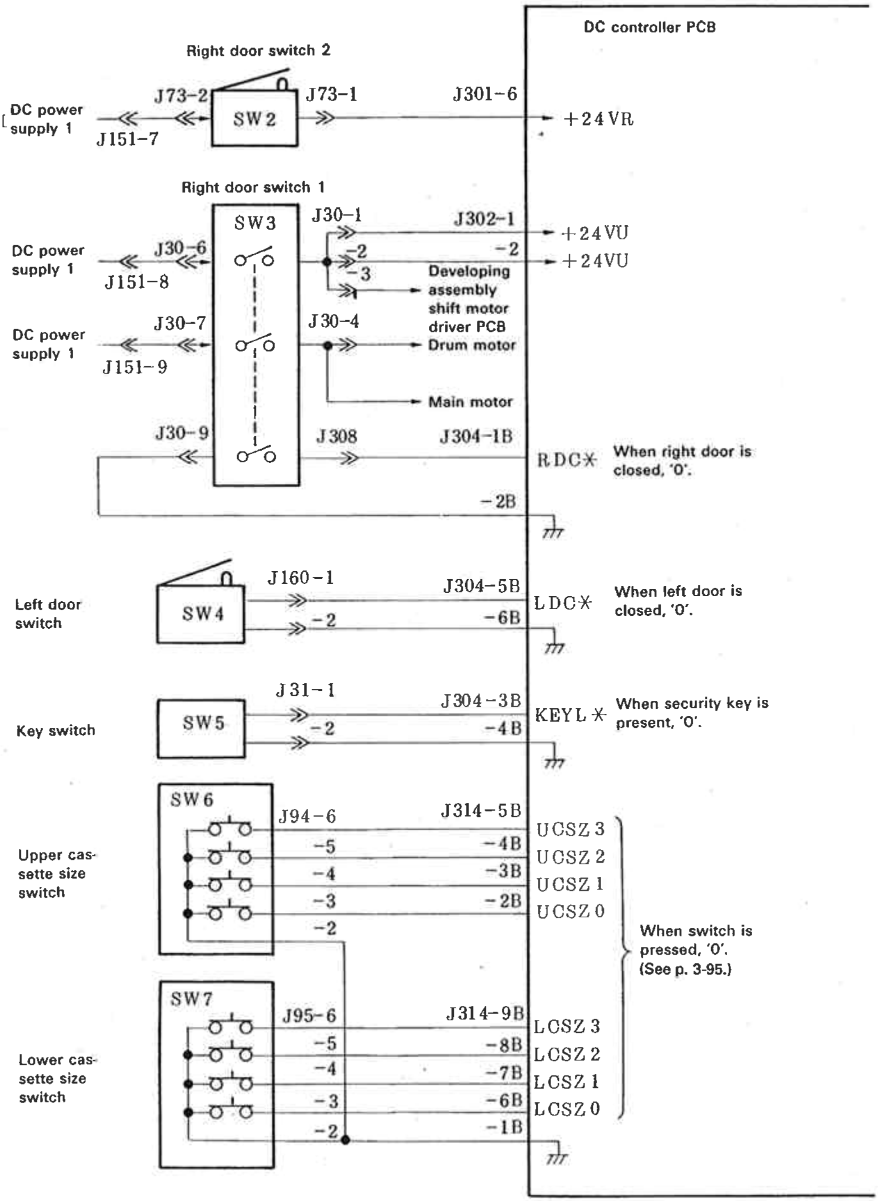

DC controller PCB
Right door switch 2
DC power supply 1
J73-2
SW2
J73-1
J301-6
+24VR
J151-7
Right door switch 1
SW3
J30-1
J302-1
+24VU
DC power supply 1
J30-6
-2
-3
-2
+24VU
J151-8
Developing assembly shift motor driver PCB
DC power supply 1
J30-7
J30-4
Drum motor
J151-9
Main motor
J30-9
J308
J304-1B
RDC*
When right door is closed, '0'.
-2B
Left door switch
SW4
J160-1
J304-5B
LDC*
When left door is closed, '0'.
-2
-6B
Key switch
SW5
J31-1
J304-3B
KEYL*
When security key is present, '0'.
-2
-4B
Upper cassette size switch
SW6
J94-6
J314-5B
UCSZ3
-5
-4B
UCSZ2
-4
-3B
UCSZ1
-3
-2B
UCSZ0
-2
When switch is pressed, '0'. (See p. 3-95.)
Lower cassette size switch
SW7
J95-6
J314-9B
LCSZ3
-5
-8B
LCSZ2
-4
-7B
LCSZ1
-3
-6B
LCSZ0
-2
-1B

Figure 3-106

Inputs to DC Controller (4/4)

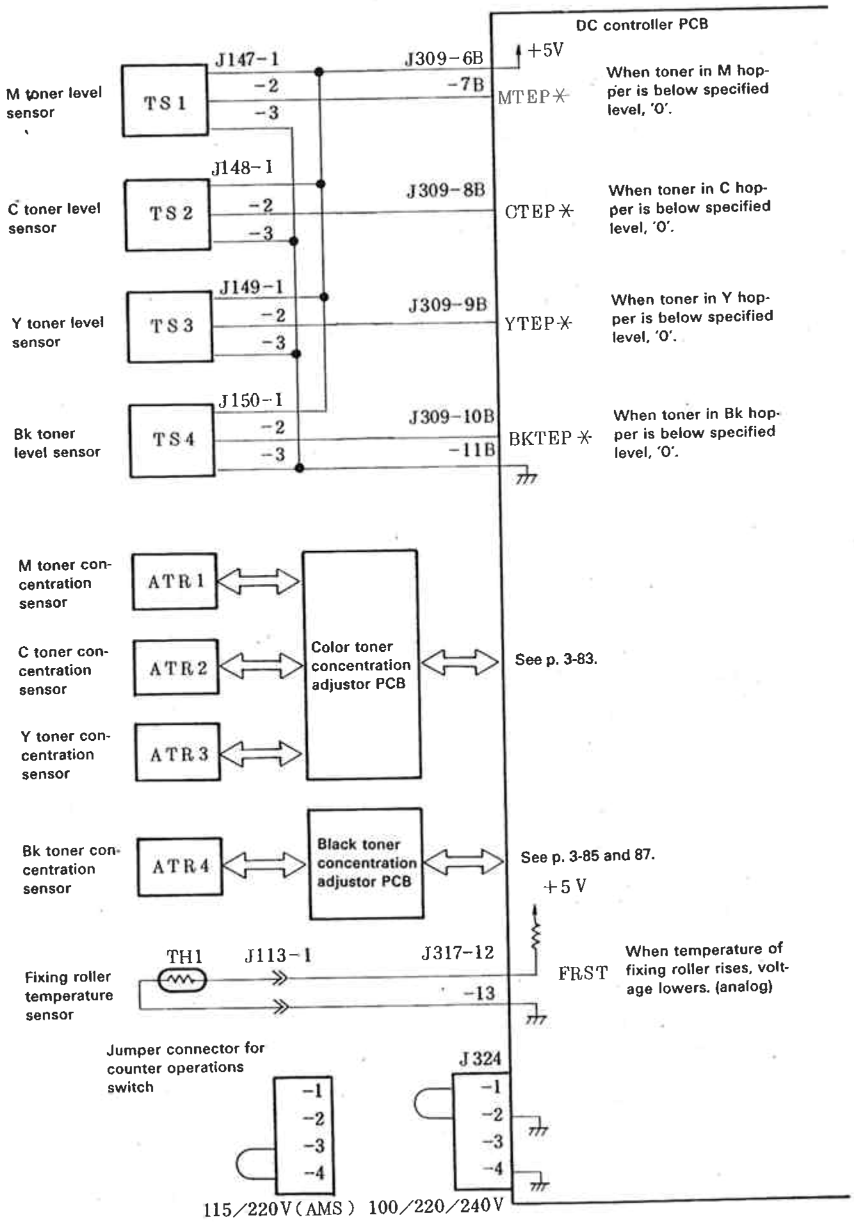

DC controller PCB
M toner level sensor
TS1
J147-1
-2
-3
J309-6B
-7B
+5V
MTEP*
When toner in M hopper is below specified level, '0'.
C toner level sensor
TS2
J148-1
-2
-3
J309-8B
CTEP*
When toner in C hopper is below specified level, '0'.
Y toner level sensor
TS3
J149-1
-2
-3
J309-9B
YTEP*
When toner in Y hopper is below specified level, '0'.
Bk toner level sensor
TS4
J150-1
-2
-3
J309-10B
-11B
BKTEP*
When toner in Bk hopper is below specified level, '0'.
M toner concentration sensor
ATR1
C toner concentration sensor
ATR2
Y toner concentration sensor
ATR3
Color toner concentration adjustor PCB
See p. 3-83.
Bk toner concentration sensor
ATR4
Black toner concentration adjustor PCB
See p. 3-85 and 87.
+5V
Fixing roller temperature sensor
TH1
J113-1
J317-12
-13
FRST
When temperature of fixing roller rises, voltage lowers. (analog)
Jumper connector for counter operations switch
-1
-2
-3
-4
J324
-1
-2
-3
-4
115/220V(AMS)
100/220/240V

Figure 3-107

Outputs from DC Controller (1/6)

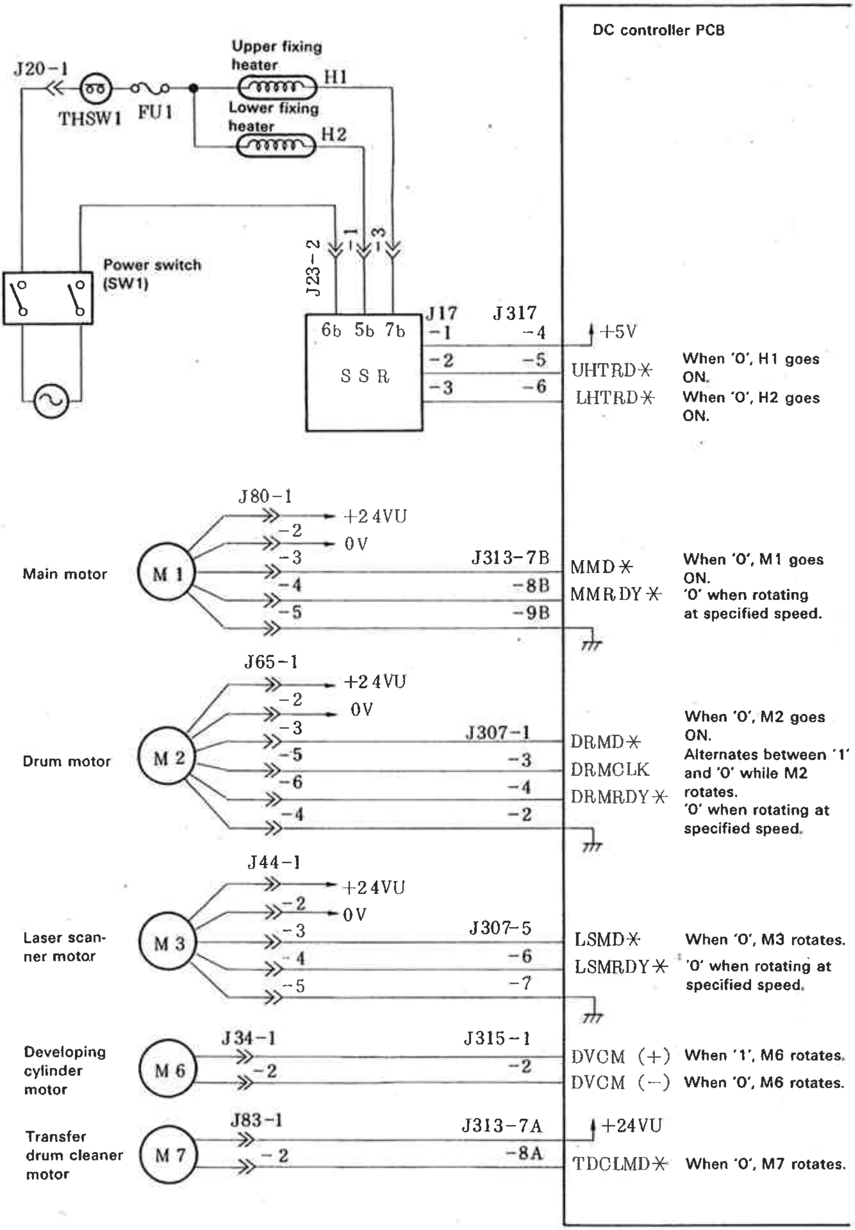

DC controller PCB
J20-1
THSW1
FU1
Upper fixing heater
H1
Lower fixing heater
H2
Power switch (SW1)
J23-2
-1
-3
6b 5b 7b
SSR
J17
-1
-2
-3
J317
-4
-5
-6
+5V
UHTRD*
LHTRD*
When '0', H1 goes ON.
When '0', H2 goes ON.
Main motor
M1
J80-1
-2
-3
-4
-5
+24VU
0V
J313-7B
-8B
-9B
MMD*
MMRDY*
When '0', M1 goes ON.
'0' when rotating at specified speed.
Drum motor
M2
J65-1
-2
-3
-5
-6
-4
+24VU
0V
J307-1
-3
-4
-2
DRMD*
DRMCLK
DRMRDY*
When '0', M2 goes ON.
Alternates between '1' and '0' while M2 rotates.
'0' when rotating at specified speed.
Laser scanner motor
M3
J44-1
-2
-3
-4
-5
+24VU
0V
J307-5
-6
-7
LSMD*
LSMRDY*
When '0', M3 rotates.
'0' when rotating at specified speed.
Developing cylinder motor
M6
J34-1
-2
J315-1
-2
DVCM (+)
DVCM (−)
When '1', M6 rotates.
When '0', M6 rotates.
Transfer drum cleaner motor
M7
J83-1
-2
J313-7A
-8A
+24VU
TDCLMD*
When '0', M7 rotates.

Figure 3-108

Outputs form DC Controller (2/6)

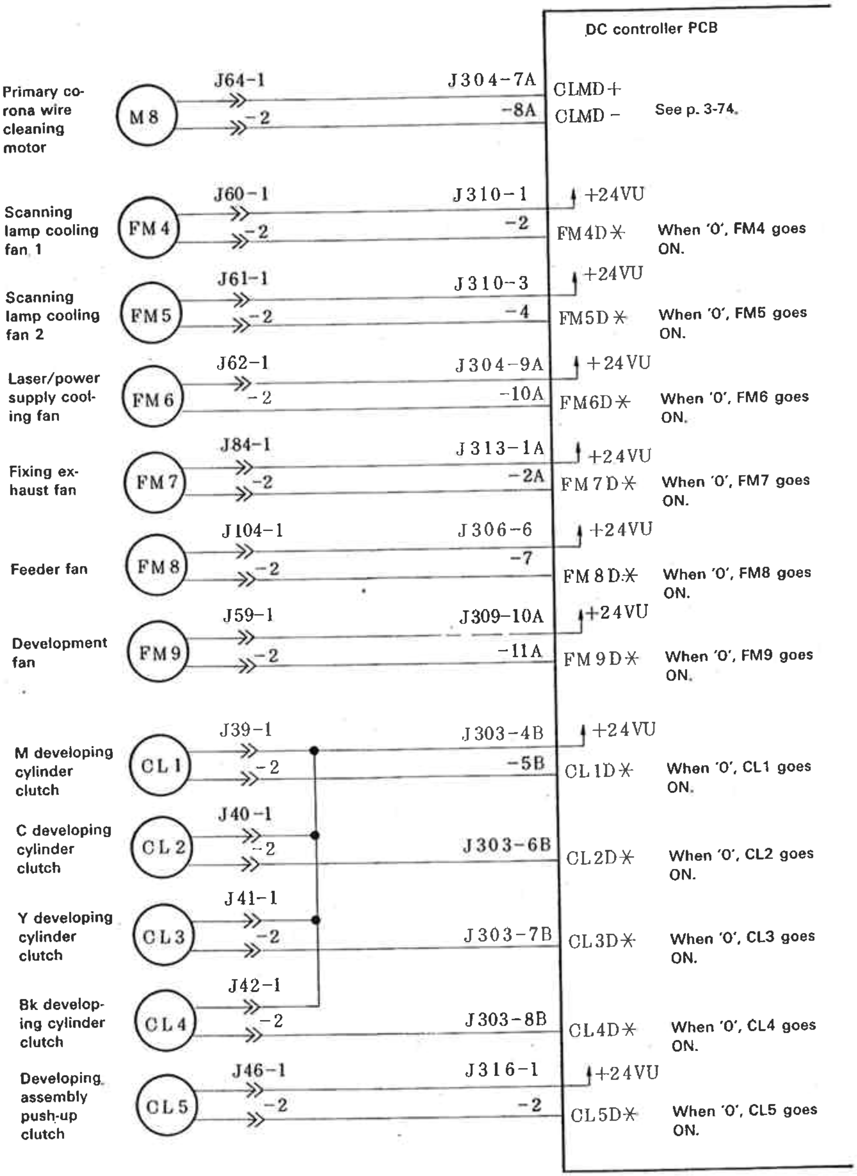

DC controller PCB
Primary corona wire cleaning motor
M8
J64-1
-2
J304-7A
-8A
CLMD+
CLMD −
See p. 3-74.
Scanning lamp cooling fan 1
FM4
J60-1
-2
J310-1
-2
+24VU
FM4D*
When '0', FM4 goes ON.
Scanning lamp cooling fan 2
FM5
J61-1
-2
J310-3
-4
+24VU
FM5D*
When '0', FM5 goes ON.
Laser/power supply cooling fan
FM6
J62-1
-2
J304-9A
-10A
+24VU
FM6D*
When '0', FM6 goes ON.
Fixing exhaust fan
FM7
J84-1
-2
J313-1A
-2A
+24VU
FM7D*
When '0', FM7 goes ON.
Feeder fan
FM8
J104-1
-2
J306-6
-7
+24VU
FM8D*
When '0', FM8 goes ON.
Development fan
FM9
J59-1
-2
J309-10A
-11A
+24VU
FM9D*
When '0', FM9 goes ON.
M developing cylinder clutch
CL1
J39-1
-2
J303-4B
-5B
+24VU
CL1D*
When '0', CL1 goes ON.
C developing cylinder clutch
CL2
J40-1
-2
J303-6B
CL2D*
When '0', CL2 goes ON.
Y developing cylinder clutch
CL3
J41-1
-2
J303-7B
CL3D*
When '0', CL3 goes ON.
Bk developing cylinder clutch
CL4
J42-1
-2
J303-8B
CL4D*
When '0', CL4 goes ON.
Developing assembly push-up clutch
CL5
J46-1
-2
J316-1
-2
+24VU
CL5D*
When '0', CL5 goes ON.

Figure 3-109

Outputs from DC Controller (3/6)

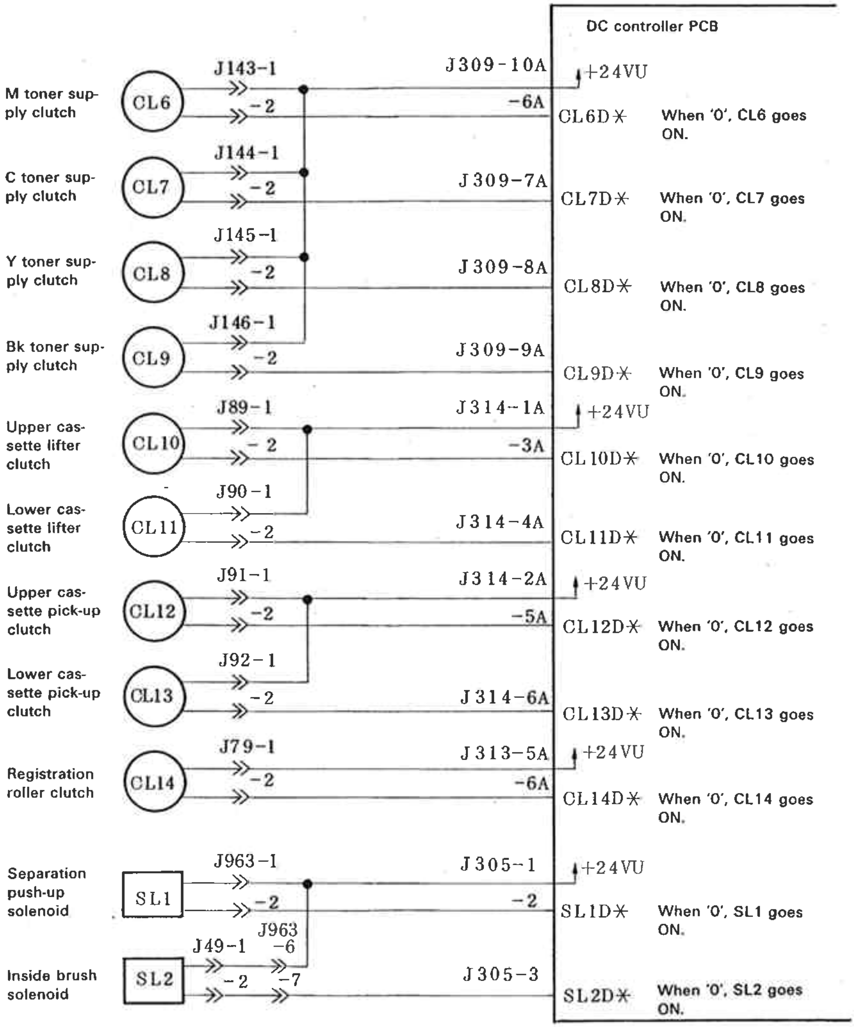

DC controller PCB
M toner supply clutch
CL6
J143-1
-2
J309-10A
-6A
+24VU
CL6D*
When '0', CL6 goes ON.
C toner supply clutch
CL7
J144-1
-2
J309-7A
CL7D*
When '0', CL7 goes ON.
Y toner supply clutch
CL8
J145-1
-2
J309-8A
CL8D*
When '0', CL8 goes ON.
Bk toner supply clutch
CL9
J146-1
-2
J309-9A
CL9D*
When '0', CL9 goes ON.
Upper cassette lifter clutch
CL10
J89-1
-2
J314-1A
-3A
+24VU
CL10D*
When '0', CL10 goes ON.
Lower cassette lifter clutch
CL11
J90-1
-2
J314-4A
CL11D*
When '0', CL11 goes ON.
Upper cassette pick-up clutch
CL12
J91-1
-2
J314-2A
-5A
+24VU
CL12D*
When '0', CL12 goes ON.
Lower cassette pick-up clutch
CL13
J92-1
-2
J314-6A
CL13D*
When '0', CL13 goes ON.
Registration roller clutch
CL14
J79-1
-2
J313-5A
-6A
+24VU
CL14D*
When '0', CL14 goes ON.
Separation push-up solenoid
SL1
J963-1
-2
J305-1
-2
+24VU
SL1D*
When '0', SL1 goes ON.
Inside brush solenoid
SL2
J49-1
-2
J963
-6
-7
J305-3
SL2D*
When '0', SL2 goes ON.

Figure 3-110

Outputs from DC Controller (4/6)

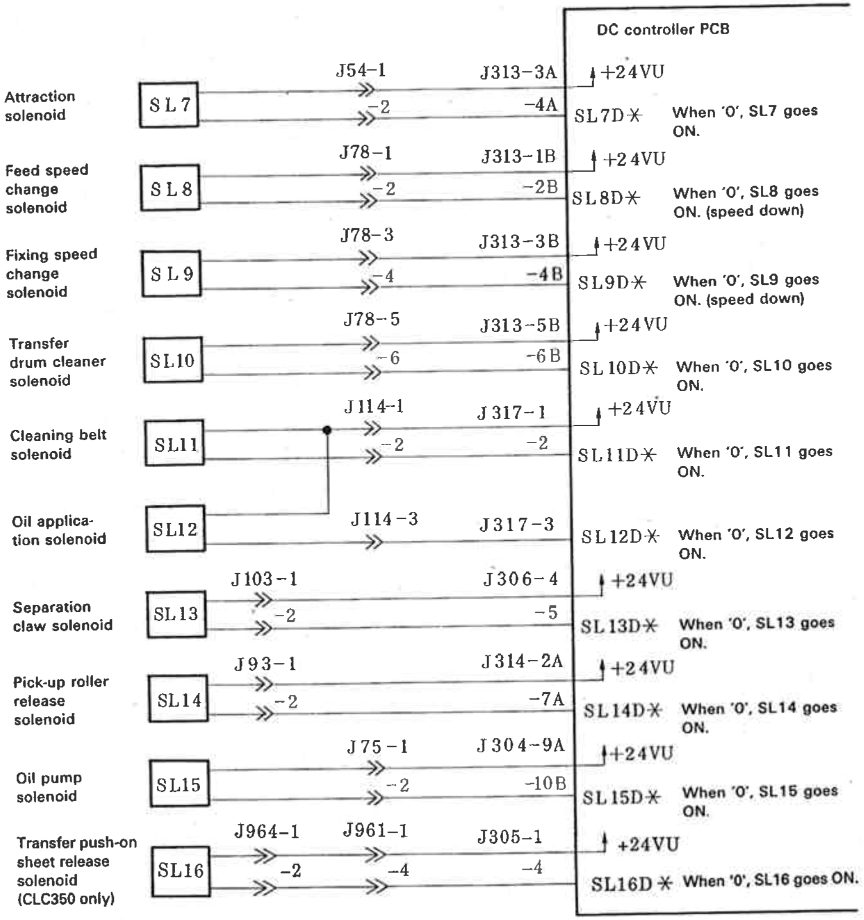

DC controller PCB
Attraction solenoid
SL7
J54-1
-2
J313-3A
-4A
+24VU
SL7D*
When '0', SL7 goes ON.
Feed speed change solenoid
SL8
J78-1
-2
J313-1B
-2B
+24VU
SL8D*
When '0', SL8 goes ON. (speed down)
Fixing speed change solenoid
SL9
J78-3
-4
J313-3B
-4B
+24VU
SL9D*
When '0', SL9 goes ON. (speed down)
Transfer drum cleaner solenoid
SL10
J78-5
-6
J313-5B
-6B
+24VU
SL10D*
When '0', SL10 goes ON.
Cleaning belt solenoid
SL11
J114-1
-2
J317-1
-2
+24VU
SL11D*
When '0', SL11 goes ON.
Oil application solenoid
SL12
J114-3
J317-3
SL12D*
When '0', SL12 goes ON.
Separation claw solenoid
SL13
J103-1
-2
J306-4
-5
+24VU
SL13D*
When '0', SL13 goes ON.
Pick-up roller release solenoid
SL14
J93-1
-2
J314-2A
-7A
+24VU
SL14D*
When '0', SL14 goes ON.
Oil pump solenoid
SL15
J75-1
-2
J304-9A
-10B
+24VU
SL15D*
When '0', SL15 goes ON.
Transfer push-on sheet release solenoid (CLC350 only)
SL16
J964-1
-2
J961-1
-4
J305-1
-4
+24VU
SL16D*
When '0', SL16 goes ON.

Figure 3-111

Outputs from DC Controller (5/6)

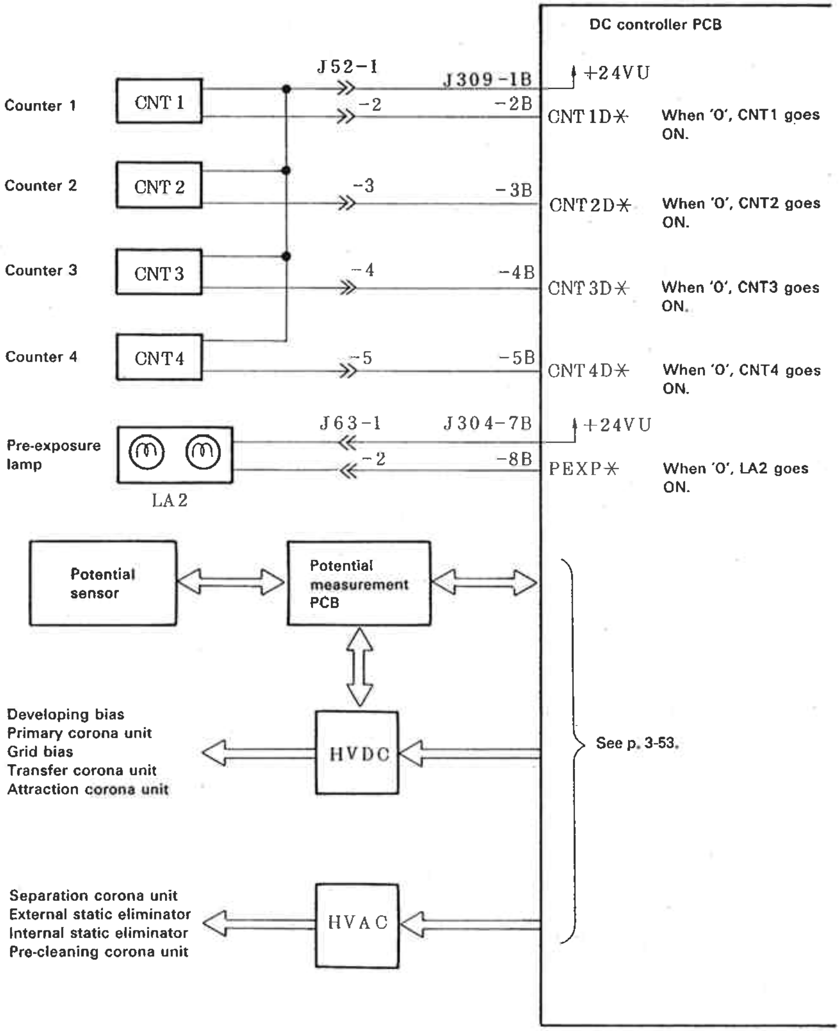

DC controller PCB
Counter 1
CNT 1
J52-1
J309-1B
+24VU
-2
-2B
CNT 1D*
When '0', CNT1 goes ON.
Counter 2
CNT 2
-3
-3B
CNT2D*
When '0', CNT2 goes ON.
Counter 3
CNT 3
-4
-4B
CNT 3D*
When '0', CNT3 goes ON.
Counter 4
CNT4
-5
-5B
CNT 4D*
When '0', CNT4 goes ON.
Pre-exposure lamp
LA 2
J63-1
J304-7B
+24VU
-2
-8B
PEXP*
When '0', LA2 goes ON.
Potential sensor
Potential measurement PCB
Developing bias
Primary corona unit
Grid bias
Transfer corona unit
Attraction corona unit
HVDC
Separation corona unit
External static eliminator
Internal static eliminator
Pre-cleaning corona unit
HVAC
See p. 3-53.

Figure 3-112

Outputs from DC Controller (6/6)

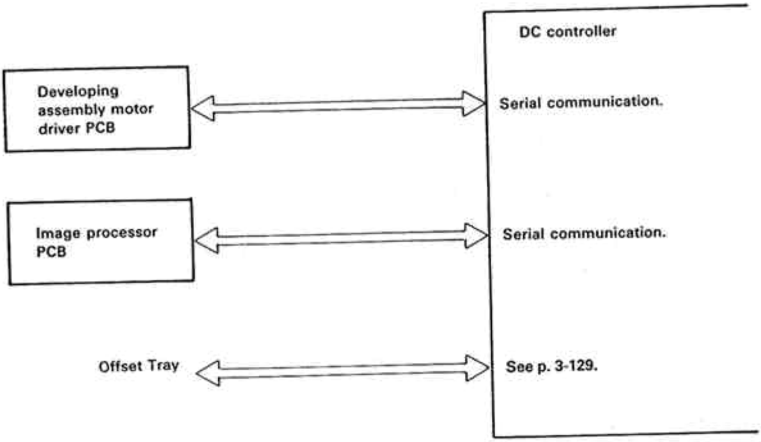
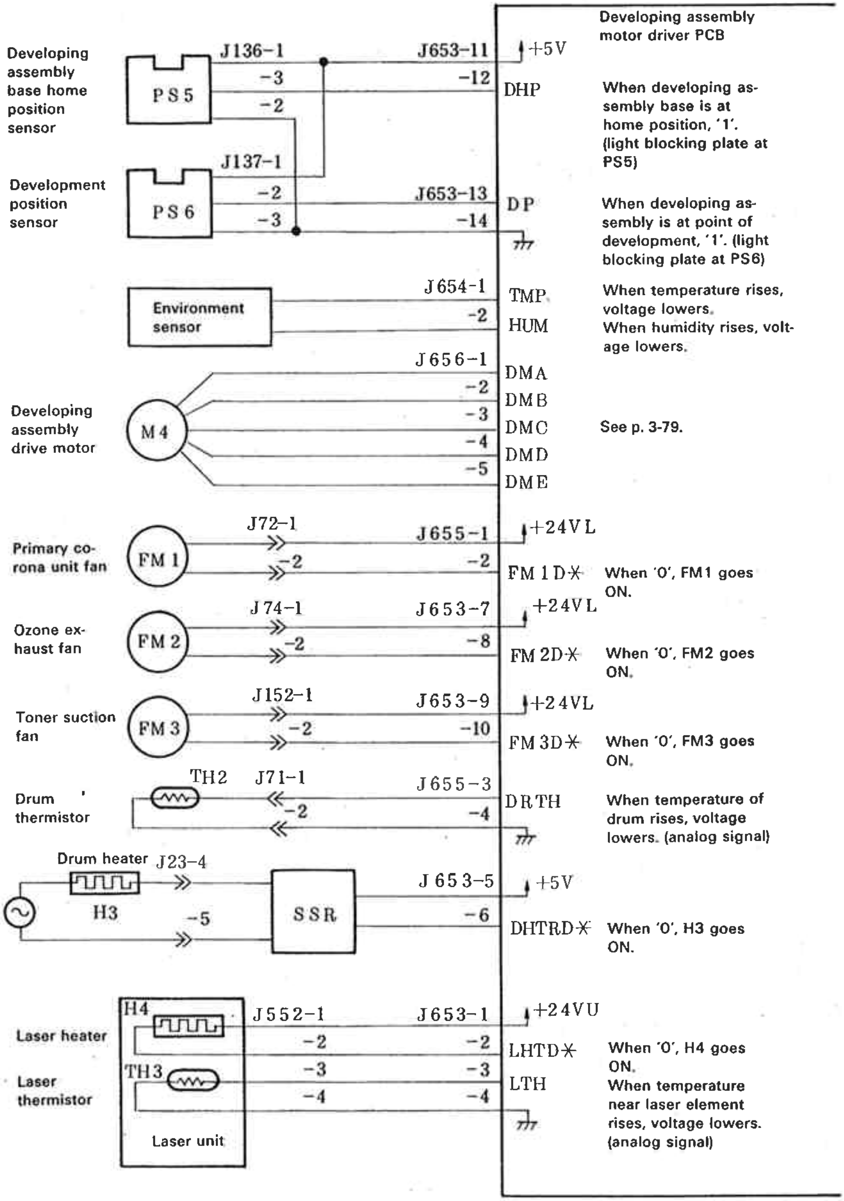

DC controller
Developing assembly motor driver PCB
Serial communication.
Image processor PCB
Serial communication.
Offset Tray
See p. 3-129.

Figure 3-113

Inputs to and Outputs from Developing Assembly Motor Driver (1/1)


Developing assembly motor driver PCB
Developing assembly base home position sensor
PS5
J136-1
-3
-2
J653-11
-12
+5V
DHP
Development position sensor
PS6
J137-1
-2
-3
J653-13
-14
DP
Environment sensor
J654-1
-2
TMP
HUM
Developing assembly drive motor
M4
J656-1
-2
-3
-4
-5
DMA
DMB
DMC
DMD
DME
Primary corona unit fan
FM1
J72-1
-2
J655-1
-2
+24VL
FM1D*
Ozone exhaust fan
FM2
J74-1
-2
J653-7
-8
+24VL
FM2D*
Toner suction fan
FM3
J152-1
-2
J653-9
-10
+24VL
FM3D*
Drum thermistor
TH2
J71-1
-2
J655-3
-4
DRTH
Drum heater
H3
J23-4
-5
SSR
J653-5
-6
+5V
DHTRD*
Laser heater
Laser thermistor
H4
TH3
Laser unit
J552-1
-2
-3
-4
J653-1
-2
-3
-4
+24VU
LHTD*
LTH

When developing assembly base is at home position, '1'. (light blocking plate at PS5)

When developing assembly is at point of development, '1'. (light blocking plate at PS6)

When temperature rises, voltage lowers.
When humidity rises, voltage lowers.

See p. 3-79.

When '0', FM1 goes ON.

When '0', FM2 goes ON.

When '0', FM3 goes ON.

When temperature of drum rises, voltage lowers. (analog signal)

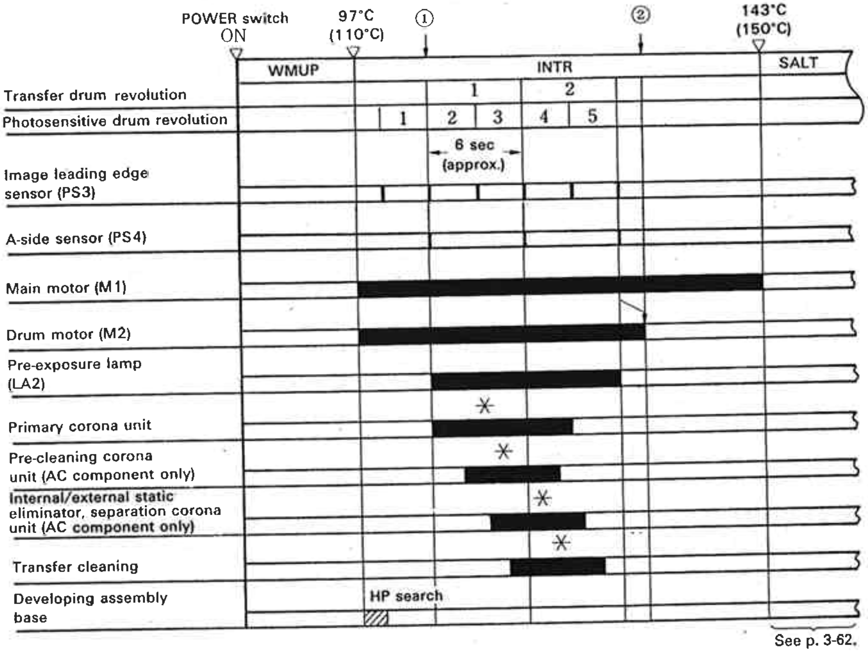
When '0', H3 goes ON.

When '0', H4 goes ON.
When temperature near laser element rises, voltage lowers. (analog signal)

Figure 3-114

D. Basic Sequence of Operations

1. Basic Sequence of Operations (power-on)



* After the removal of the jam, the CLC200 makes 3 rotations; in the case of the CLC300/350, 4 rotations.

Figure 3-115

Note:

i. The copy operation is controlled based on the 'image leading edge signal' generated by the transfer drum; exceptions to this are explained with separate timing charts.

ii. The diameter of the transfer drum is about twice that of the photosensitive drum; therefore, the photosensitive drum rotates twice for each single rotation of the transfer drum.

iii. Once the drum motor goes ON, it keeps rotating up to point 1, i.e., until the A-side sensor goes ON to identify side A or B (see p. 3-21); thereafter, a count is taken of the rotation of the transfer drum starting at point 1 (0.7 rotation). The transfer drum is assumed to have made three rotations (completion of transfer drum rotation) at point 2.

iv. The fixing temperature shown represents the reading shown for 'ANALOG' under 'DISPLAY' of the service mode; the values in parentheses represent the temperature measured actually.

Period		Description	Remarks
WMUP (warm-up)	Between when the POWER switch is turned ON and when the temperature of the fixing roller reaches 97°C (110°C).	Waits for the fixing roller to heat.	• The warm-up varies in time depending on the initial temperature of the fixing roller. • If the temperature is 74°C (100°C) or less, the primary corona wire is cleaned.
INTR (initial rotation)	Between when the temperature of the fixing roller reaches 97°C (110°C) and when it reaches 143°C (150°C).	Stabilizes the sensitivity of the photosensitive drum, and discharges and cleans the transfer drum in preparation for a copy run. Causes the temperature of the fixing roller to be uniform.	• The transfer drum makes 3 rotations and stops at its home position.
SALT (drum toner concentration control)	Between when INTR is over and when SALT is over*.	Obtains a correction value for the target contrast potential and a correction curve for gradation.	See p. 3-62. (CLC350 only)
STBY (standby)	Between completion of SALT and when the COPY START key is pressed or the POWER switch is turned OFF.	Waits for the COPY START key or other operation key to be pressed.	'READY TO COPY' is indicated.

* The drum toner concentration control mechanism (SALT) is started as soon as the fixing temperature and the laser unit temperature have reached specific values. If the fixing temperature reaches its specific value earlier than the laser unit temperature, the main motor will be stopped, and SALT will not be started until the laser unit temperature reaches its specific value. SALT, however, will not be executed if the fixing temperature is 74°C (100°C) or more when the machine is switched ON.

Table 3-100

2. Basic Sequence of Operations (copying)

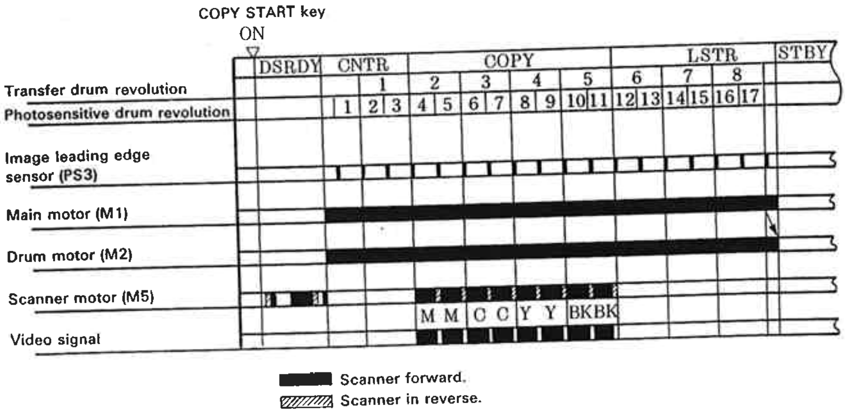

COPY START key
ON
DSRDY
CNTR
COPY
LSTR
STBY
Transfer drum revolution
1 2 3 4 5 6 7 8
Photosensitive drum revolution
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17
Image leading edge sensor (PS3)
Main motor (M1)
Drum motor (M2)
Scanner motor (M5)
M M C C Y Y BK BK
Video signal
Scanner forward.
Scanner in reverse.

Figure 3-116 A4/LTR, 2 Copies, 4-Color, DIRECT, Document Detection ON, Potential Control ON

Period		Description	Remarks
DSRDY (scanner ready)	Between when the COPY START key is pressed and when the transfer drum starts to rotate.	• Measures shading correction values. • Performs a document detection scan.	
CNTR (control rotation)	After DSRDY until the transfer drum has made about 1.7 rotations.	• Measures and controls the surface potential of the drum. • Stabilizes the sensitivity of the drum in preparation for a copy run. • Discharges and cleans the transfer drum. • Picks up copy paper. • For the CLC300/350, check the dirt on the black toner concentration sensor.	For the CLC200/300, with potential control OFF, goes to COPY when the transfer drum makes a 1.2 rotation.
COPY (copy)	Between when the copy paper starts to wind around the transfer drum and when all toner has been transferred on the paper.	Turns the laser ON and OFF according to the video signals to develop and transfer the specified colors.	

Talbe 3-101

Period		Description	Remarks
LSTR (last rotation)	Between the end of COPY and when the main motor stops. (equivalent of about 3.3 roations of transfer drum)	• Delivers the copy paper. • Stabilizes the sensitivity of the drum. • Discharges and cleans the transfer drum.	The transfer drum stops at its home position.

Table 3-101a

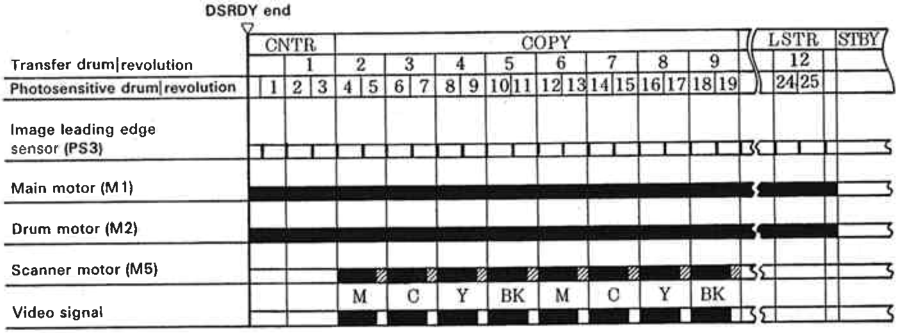

DSRDY end
CNTR
COPY
LSTR
STBY
Transfer drum|revolution
1 2 3 4 5 6 7 8 9 12
Photosensitive drum|revolution
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 24 25
Image leading edge sensor (PS3)
Main motor (M1)
Drum motor (M2)
Scanner motor (M5)
Video signal
M C Y BK M C Y BK

Figure 3-117 A3/LDG, 2 Copies, 4-Color, DIRECT, Potential Control ON

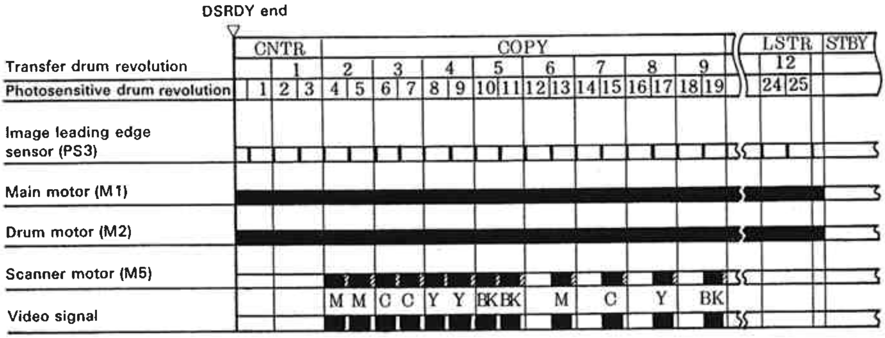

DSRDY end
CNTR
COPY
LSTR
STBY
Transfer drum revolution
1 2 3 4 5 6 7 8 9 12
Photosensitive drum revolution
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 24 25
Image leading edge sensor (PS3)
Main motor (M1)
Drum motor (M2)
Scanner motor (M5)
Video signal
M M C C Y Y BK BK M C Y BK

Figure 3-118 A4/LTR, 3 Copies, 4-Color, DIRECT, Potential Control ON

E. Generation of Image Leading Edge Signal

1. Outline

The operation of CLC200/300/350 is controlled with reference to the position of the transfer drum so that a maximum of four colors may be laid over a single point.

When the leading edge of the copy paper on the transfer drum comes to the leading edge of the image (see Figure 3-119), the image leading edge sensor (PS3) is blocked by the signal plate to generate the image leading edge signal (ILEG).

Such operations as document exposure, image processing, laser exposure, high voltage application, and feeding are controlled based on the ILEG signals.

Note:
See Figure 3-119 for the position of the copy paper when the image leading edge signal is generated.
Distance ①, over which laser exposure and transfer occur on the photosensitive drum, and distance ②, over which transfer occurs and the leading edge of the copy paper is found, are identical.

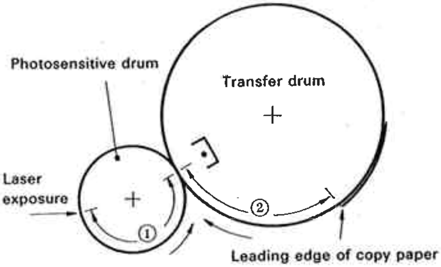

Photosensitive drum
Transfer drum
Laser exposure
①
②
Leading edge of copy paper

Figure 3-119

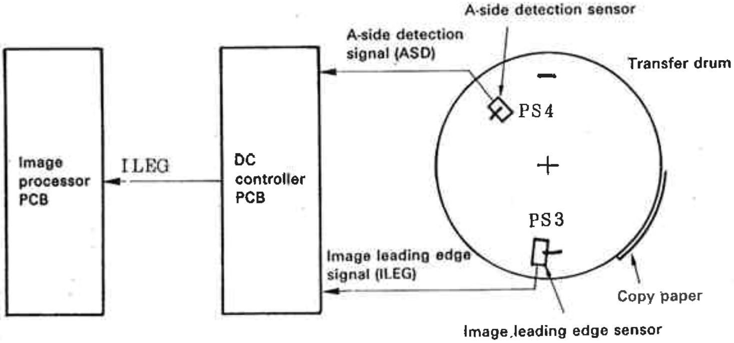

A-side detection sensor
A-side detection signal (ASD)
Transfer drum
PS4
Image processor PCB
ILEG
DC controller PCB
PS3
Image leading edge signal (ILEG)
Copy paper
Image leading edge sensor

Figure 3-120

2. A-/B-Side Control

To increase the copying speed, the CLC 300 is designed such that two sheets of copy paper are sometimes placed on the transfer drum at the same time; 4-color continuous on A4/LTR. See Figure 3-124.

The arrangement requires that ILEG be issued for each sheet and, to this effect, two signal plates for PS3 are provided opposite each other.

The DC controller identifies which signal plate has blocked PS3; i.e., states of PS3 and PS4.

PS3 and PS4 are ON
└→Image leading edge signal for A-side
PS3 is ON; PS4 is OFF
└→Image leading edge signal for B-side

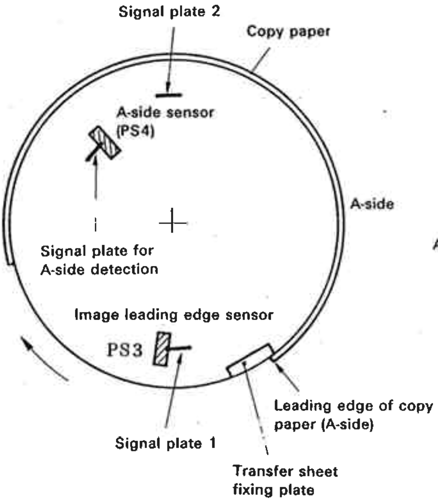

Signal plate 2
Copy paper
A-side sensor (PS4)
A-side
Signal plate for A-side detection
Image leading edge sensor
PS3
Leading edge of copy paper (A-side)
Signal plate 1
Transfer sheet fixing plate

Figure 3-121 A-Side Image Leading Edge Signal

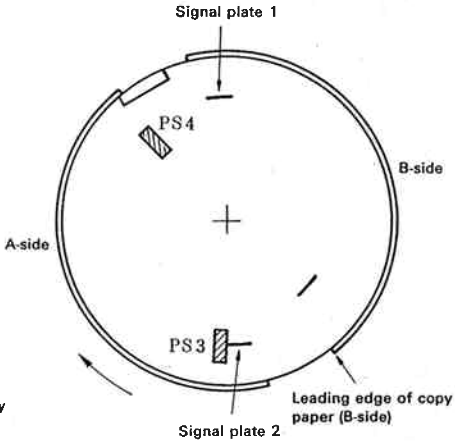

Signal plate 1
PS4
B-side
A-side
PS3
Leading edge of copy paper (B-side)
Signal plate 2

Figure 3-122 B-Side Image Leading Edge Signal

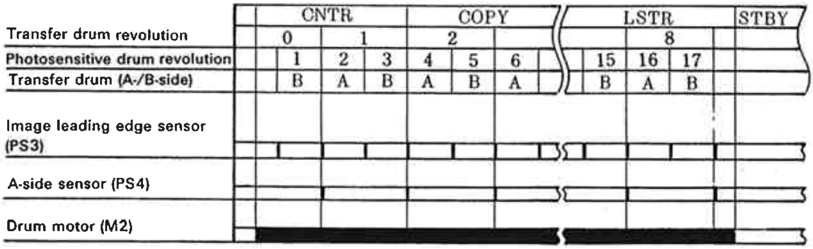

CNTR
COPY
LSTR
STBY
Transfer drum revolution
0
1
2
8
Photosensitive drum revolution
1
2
3
4
5
6
15
16
17
Transfer drum (A-/B-side)
B
A
B
A
B
A
B
A
B
Image leading edge sensor (PS3)
A-side sensor (PS4)
Drum motor (M2)

Figure 3-123

Note:
In this manual, attraction of the leading edge of copy paper on the transfer sheet is referred to as "A-side attraction," and attraction thereof 180 deg. opposite is referred to as "B-side attraction." "C-side attraction," on the other hand, is used to refer to attraction about 74 deg. away from A-side attraction; such attraction is noted when copying on OHP films or copying from a projector to A4 or A4R (LTR or LTR-R).

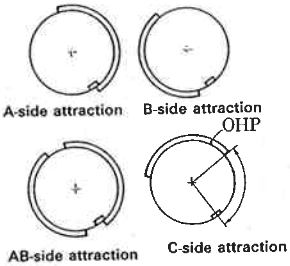


Figure 3-124

Figure 3-125 shows attraction of copy paper on the transfer drum for each copy mode; the arrangement is the same for M and for C, Y, and Bk in mono. In 2-color, it is the same for MY, MC, and CY.

The distinction between small and large sizes here differs from that made in reference to the cassette holder. If small-size paper is used with the potential measurement disabled, CNTR finishes earlier (by equivalent of 0.5 rotation of the transfer drum), and copying starts with side B (CLC200/300 only).

Small size. .... 216 mm (A4/LTR) or less in feed direction.
Large size. .... 217 mm or more in feed direction.
$\frac{2}{M}$ .... 2 stands for the second copy paper; and M, development of magenta.

CNTR end
▽

Transfer drum revolution		2	3	4	5	6	7	8	9	10	11	12	13	14
Leading edge of copy paper		A B	A B	A B	A B	A B	A B	A B	A B	A B	A B	A B	A B	A B
Mono (M)	5 S copies	$\frac{1}{M}\frac{2}{M}$	$\frac{3}{M}\frac{4}{M}$	$\frac{5}{M}$										
	3 L copies	$\frac{1}{M}$	$\frac{2}{M}$	$\frac{3}{M}$										
2-color (MY)	5 S copies	$\frac{1}{M}$	$\frac{1}{Y}$	$\frac{2}{M}$	$\frac{2}{Y}$	$\frac{3}{M}$	$\frac{3}{Y}$	$\frac{4}{M}$	$\frac{4}{Y}$	$\frac{5}{M}$	$\frac{5}{Y}$			
	3 L copies	$\frac{1}{M}$	$\frac{1}{Y}$	$\frac{2}{M}$	$\frac{2}{Y}$	$\frac{3}{M}$	$\frac{3}{Y}$							
3-color (MCY)	5 S copies	$\frac{1}{M}\frac{2}{M}$	$\frac{1}{C}\frac{2}{C}$	$\frac{1}{Y}\frac{2}{Y}$	$\frac{3}{M}$	$\frac{4}{M}\frac{3}{C}$	$\frac{4}{C}\frac{3}{Y}$	$\frac{4}{Y}$	$\frac{5}{M}$	$\frac{5}{C}$	$\frac{5}{Y}$			
	3 L copies	$\frac{1}{M}$	$\frac{1}{C}$	$\frac{1}{Y}$	$\frac{2}{M}$	$\frac{2}{C}$	$\frac{2}{Y}$	$\frac{3}{M}$	$\frac{3}{C}$	$\frac{3}{Y}$				
4-color (MCYBk)	5 S copies	$\frac{1}{M}\frac{2}{M}$	$\frac{1}{C}\frac{2}{C}$	$\frac{1}{Y}\frac{2}{Y}$	$\frac{1}{BK}\frac{2}{BK}$	$\frac{3}{M}$	$\frac{4}{M}\frac{3}{C}$	$\frac{4}{C}\frac{3}{Y}$	$\frac{4}{Y}\frac{3}{BK}$	$\frac{4}{BK}$	$\frac{5}{M}$	$\frac{5}{C}$	$\frac{5}{Y}$	$\frac{5}{BK}$
	3 L copies	$\frac{1}{M}$	$\frac{1}{C}$	$\frac{1}{Y}$	$\frac{1}{BK}$	$\frac{2}{M}$	$\frac{2}{C}$	$\frac{2}{Y}$	$\frac{2}{BK}$	$\frac{3}{M}$	$\frac{3}{C}$	$\frac{3}{Y}$	$\frac{3}{BK}$	

Figure 3-125

F. Main Motor

The main motor (M1) is a brushless DC motor with a built-in speed control circuit. The motor rotates at a constant speed when the DC controller PCB causes the main motor drive signal (MMD✱) to go '0'.

If the speed of the motor deviates for some reason, the motor causes the main motor ready signal (MMRDY✱) to go '1', and the DC controller PCB indicates 'E012' on the control panel.

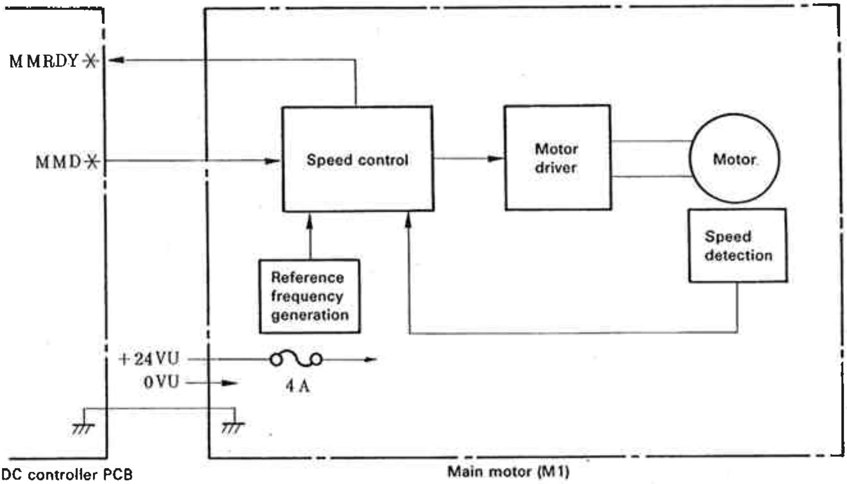

MMRDY✱
MMD✱
Speed control
Motor driver
Motor
Speed detection
Reference frequency generation
+24VU
0VU
4A
DC controller PCB
Main motor (M1)

Figure 3-126

G. Drum Motor

The drum motor (M2) is a brushless DC motor with a built-in speed control circuit. When the DC controller PCB causes the drum motor drive signal (DRMD✱) to go '0', it rotates at a constant speed.

If the speed of the motor deviates for some reason, the motor causes the drum motor ready signal (DRMRDY✱) to go '1', and the DC controller PCB indicates 'E010' on the control panel.

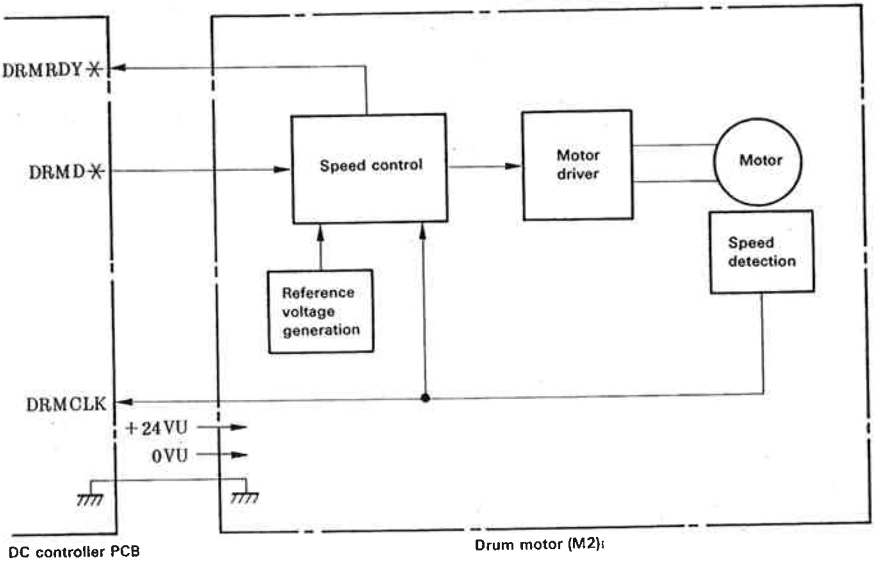

DRMRDY✱
DRMD✱
DRMCLK
+24VU
0VU
Speed control
Motor driver
Motor
Speed detection
Reference voltage generation
DC controller PCB
Drum motor (M2)

Figure 3-127

II. EXPOSURE SYSTEM (scanning lamp)

A. Changing the Reproduction Ratios

To change the reproduction ratio in the main scanning direction (across the drum), the image signals are skipped (REDUCE) when written into line memory or repeated (ENLARGE) when read out of line memory. To change the reproduction ratio in the sub scanning direction, the mirror mount is moved faster (REDUCE) or slowed down (ENLARGE).

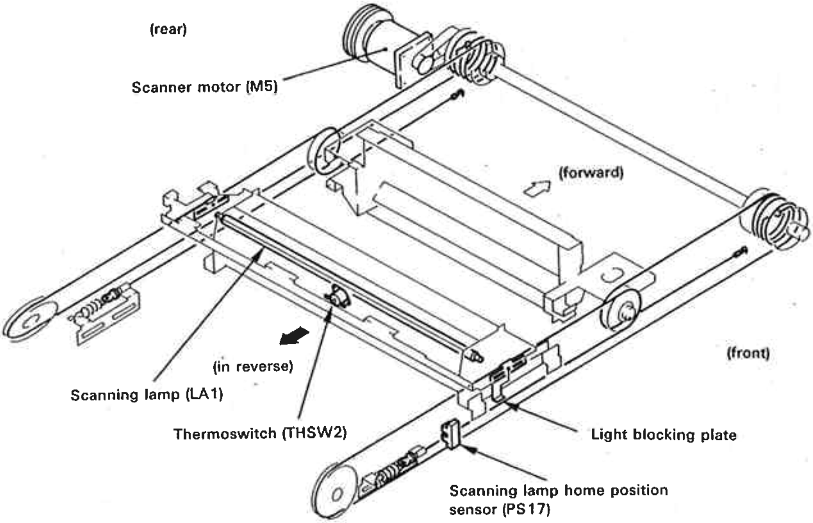

(rear)
Scanner motor (M5)
(forward)
(in reverse)
Scanning lamp (LA1)
Thermoswitch (THSW2)
(front)
Light blocking plate
Scanning lamp home position sensor (PS17)

Figure 3-200 (CLC200)

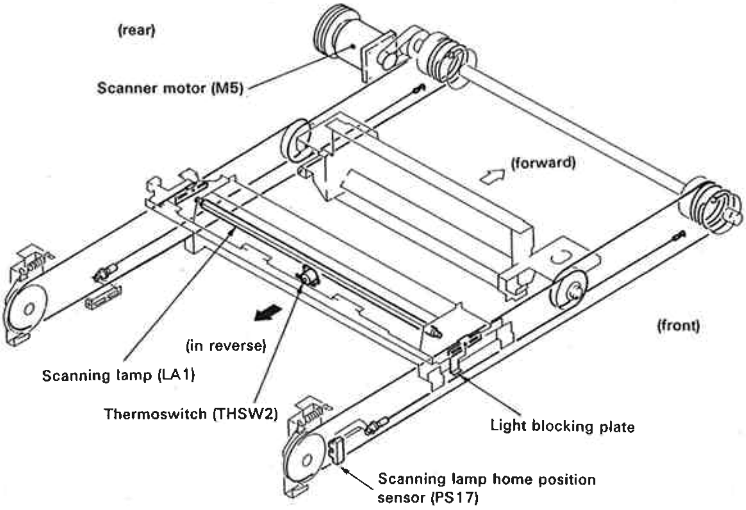
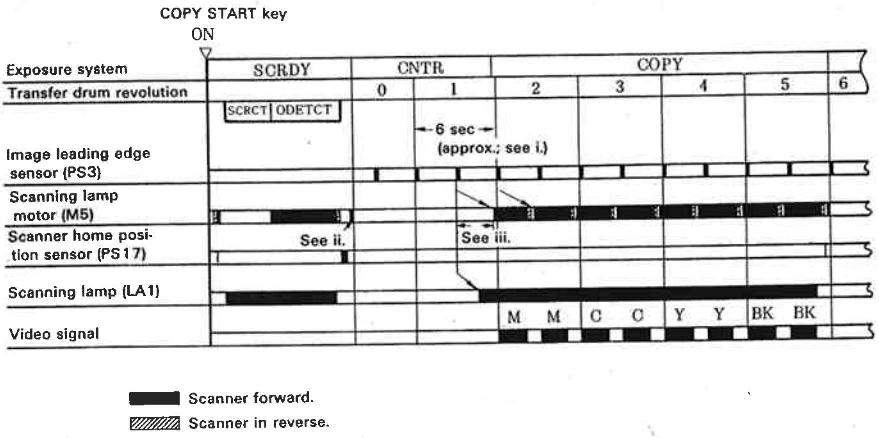

(rear)
Scanner motor (M5)
(forward)
(in reverse)
Scanning lamp (LA1)
Thermoswitch (THSW2)
(front)
Light blocking plate
Scanning lamp home position sensor (PS17)

Figure 3-200a (CLC300/350)

B. Basic Sequence of Operations (scanning lamp)

1. Sequence


COPY START key
ON
Exposure system
Transfer drum revolution
SCRDY
CNTR
COPY
0
1
2
3
4
5
6
SCRCT
ODETCT
6 sec
(approx.; see i.)
Image leading edge sensor (PS3)
Scanning lamp motor (M5)
See ii.
See iii.
Scanner home position sensor (PS17)
Scanning lamp (LA1)
Video signal
M
M
C
C
Y
Y
BK
BK
■ Scanner forward.
▨ Scanner in reverse.

i. Potential control and pick-up.
ii. The distance moved forward is increased in moving the image to the leading edge on the copy paper.
iii. The forward movement is started with a delay in moving the image to the trailing edge on the copy paper; it also varies according to the reproduction ratio selected.

Figure 3-201 A4/LTR, 2 Copies, 4-Color, DIRECT, Document Detection ON

SCRCT: Takes measurements for shading correction.
ODETCT: Performs document position detection, black document detection, and AE measurement.

2. Scanner Home Position Sensor and Operations

Sensor	Scanner		Operation
	Forward	In reverse	
Scanner home position sensor (PS17; DSCHP)		↑	Switches to forward movement.
	↓		Moves forward 1 mm; thereafter, stops*. * Home position.

Table 3-200

The scanner home position sensor goes ON in response to the following:

- Completion of the home position search at power-on; and
- Completion of all scans for the number of copies set.

The sensor will not go ON during continuous copying; should it go ON for some reason, the document scan is stopped immediately.

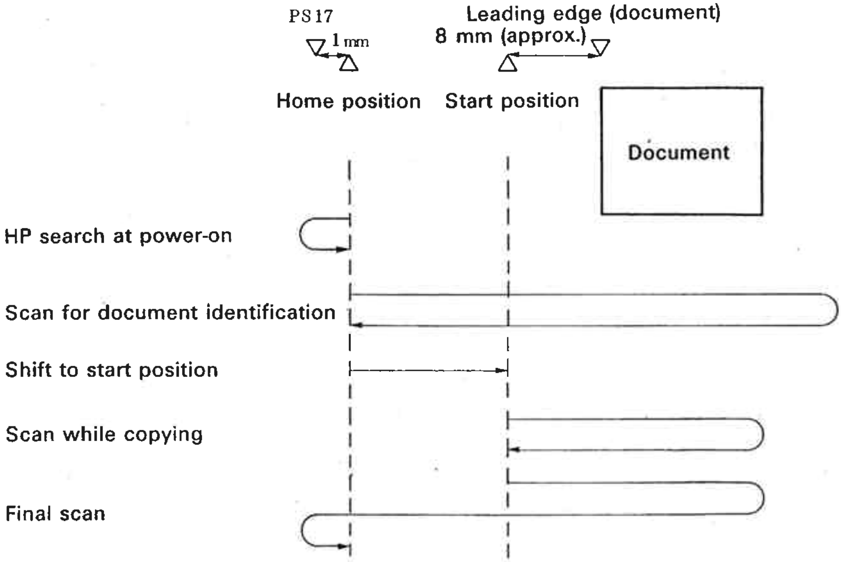

PS17
1 mm
Leading edge (document)
8 mm (approx.)
Home position
Start position
Document
HP search at power-on
Scan for document identification
Shift to start position
Scan while copying
Final scan

Figure 3-201A

C. Scanner Motor

1. Outline

Figure 3-203 shows the circuit which controls the scanner motor and has the following functions:

① Controls the direction of the scanner motor.

② Controls the speed of the scanner motor.

The scanner motor rotates in opposite directions in moving the scanner forward and in reverse, and its speed varies when the scanner moves forward according to the reproduction ratio selected.

The speed is constant when the scanner moves in reverse, and it is about 15 times as fast as when the scanner moves forward in the direct mode.

Note:
In the CLC200/300/350, the interval between two sheets of copy paper on the transfer drum is much shorter than that in conventional machines (35 mm min.); to accommodate this, the scanner is made to reverse at a high speed.

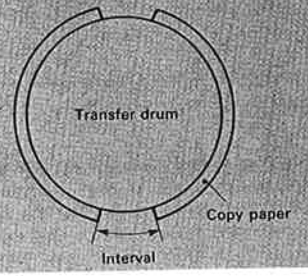

Transfer drum
Copy paper
Interval

Figure 3-202

2. Operation

The microprocessor (Q651) on the scanner motor driver PCB receives such instructions from the image processor PCB as on scanning mode, interval, and reproduction ratio; and, in response to a start command, it sends drive pulses to the scanner motor.

The scanner motor is a 5-phase stepping motor and controls the direction and speed of scanning by varying the order of the drive pulses (A through E) and frequency.

The drive voltage switching circuit switches the power used to drive the motor from 6 V (forward) to 40 V (reverse) to rotate the motor at different speeds.

The constant current control circuit, further, controls the current to a constant value to suit the speed of the motor.

To stop the motor as in the standby mode, the current to the motor is cut off by means of the HOLD-OFF signal, thereby preventing excessive heating of the motor.

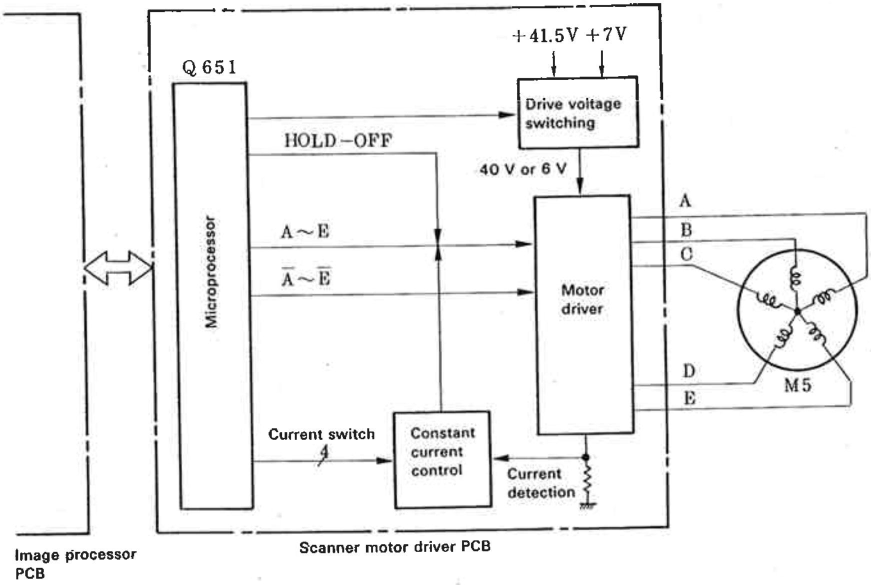

+41.5V +7V
Q651
Drive voltage switching
HOLD−OFF
40 V or 6 V
A~E
Ā~Ē
Microprocessor
Motor driver
A
B
C
D
E
M5
Current switch
4
Constant current control
Current detection
Image processor PCB
Scanner motor driver PCB

Figure 3-203

D. Scanning Lamp Control

The scanning lamp (LA1) is turned ON and OFF by the lamp regulator drive signal (LAON✳) generated by the image processor PCB.

When LAON✳=0, the scanning lamp is supplied with lamp power to turn it ON.

Note:
The output of the lamp regulator can be varied between 52 VDC and 66 VDC according to the setting of the VR on the lamp regulator; the VR is set in the service mode.

The machine is equipped with the following three protection mechanisms to prevent malfunction of the scanning lamp.

- The power to the scanning lamp will be cut off if the lamp remains ON for one minute or more because of a short circuit in the lamp ON control circuit.
- The thermal switch will go OFF to cut the power to the scanning lamp if the internal temperature of the switch exceeds 205°C.
- The fuse will blow to cut the power to the lamp regulator if an overcurrent flows because of a short circuit around the scanning lamp.

Note:
The thermoswitch (TRHSW2) is used on a DC line and, therefore, its contact is subject to damage when it is activated. Do not use it once it has been activated, or it may not function as expected.

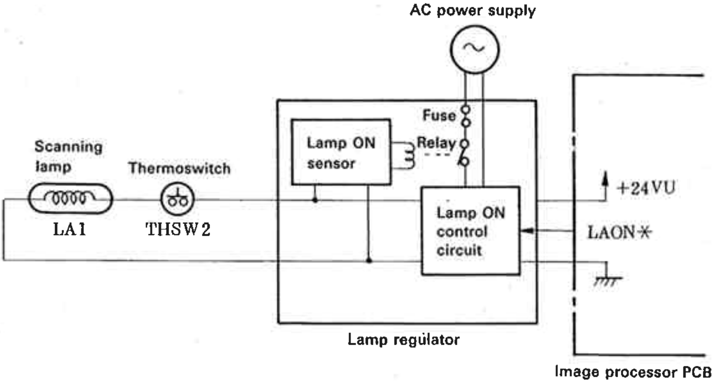

AC power supply
Fuse
Relay
Lamp ON sensor
Scanning lamp
Thermoswitch
LA1
THSW2
Lamp ON control circuit
+24VU
LAON✳
Lamp regulator
Image processor PCB

Figure 3-204

III. IMAGE PROCESSING SYSTEM

A. Outline

The image processing system consists of the CCD, CCD driver PCB, analog processor PCB, and image processor PCB; and it serves to convert the optical image brought about by the optical unit to electrical signals, correct and process the signals, and send them to the laser unit.

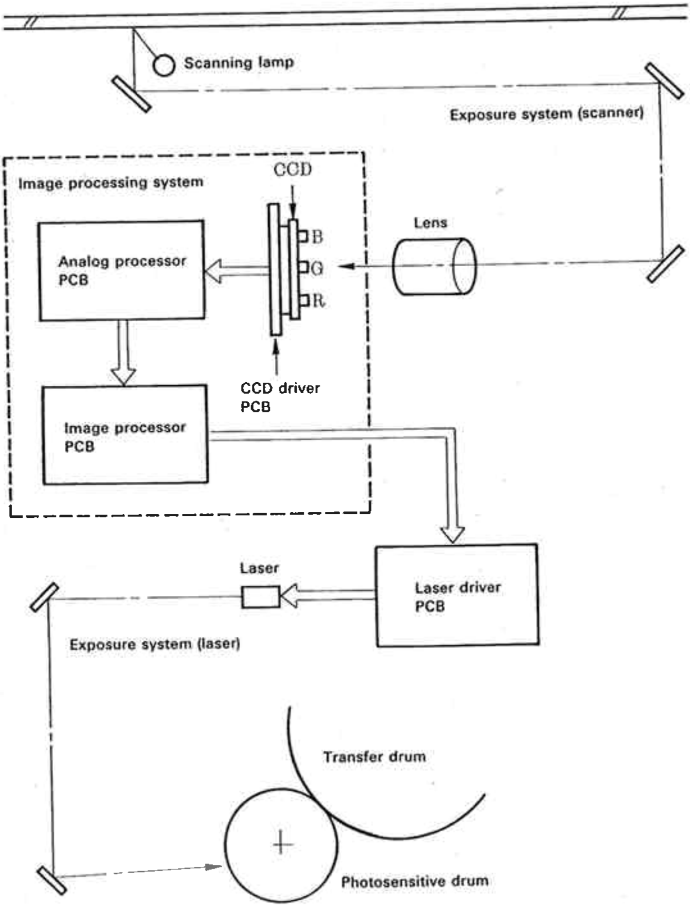

Scanning lamp
Exposure system (scanner)
Image processing system
CCD
B
G
R
Lens
Analog processor PCB
Image processor PCB
CCD driver PCB
Laser
Laser driver PCB
Exposure system (laser)
Transfer drum
Photosensitive drum

Figure 3-300

B. CCD and CCD Driver

1. CCD

The CCD (charge coupled device) used in the CLC200/300/350 consists of three CCDs with about 5,000 photo cells, and each CCD is covered with its own filter, i.e., B, G, or R.

Each CCD, further, consists of two transfer sections and two output sections; the output of the odd-number reception units and the output of the even-number reception units are sent out from output units A and B, respectively. In other words, the CCD sends out image signals of six channels at the same time.

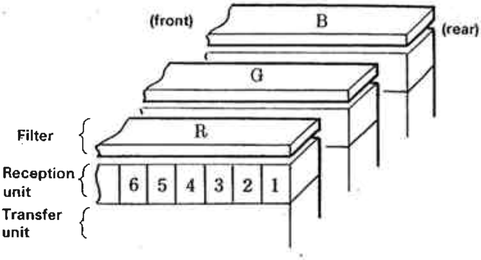

(front)
B
(rear)
G
R
Filter
Reception unit
6
5
4
3
2
1
Transfer unit

Figure 3-301

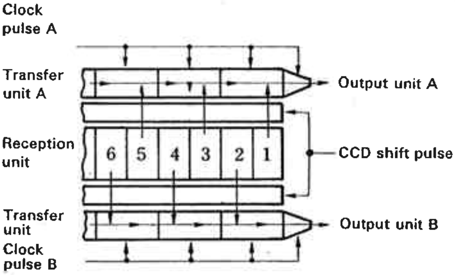
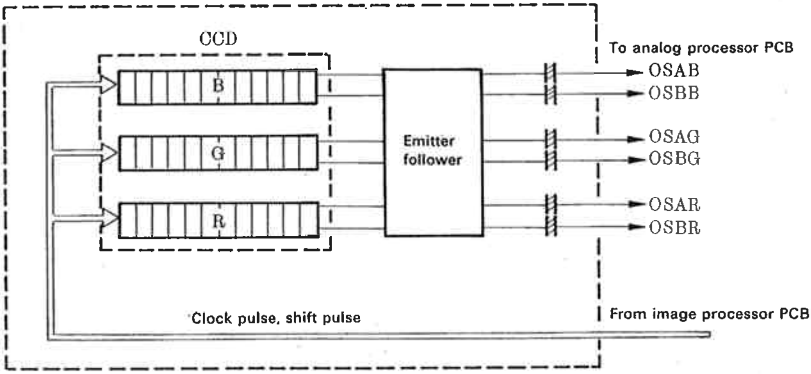

Clock pulse A
Transfer unit A
Output unit A
Reception unit
6
5
4
3
2
1
CCD shift pulse
Transfer unit
Output unit B
Clock pulse B

Figure 3-302

2. CCD Driver PCB

The image signals output by the CCD are processed by the emitter follower to a low impedance, rid of the DC component, and sent to the analog processor PCB.


CCD
B
G
R
Emitter follower
To analog processor PCB
OSAB
OSBB
OSAG
OSBG
OSAR
OSBR
Clock pulse, shift pulse
From image processor PCB

CCD driver PCB

Figure 3-303

C. Analog Image Processor PCB

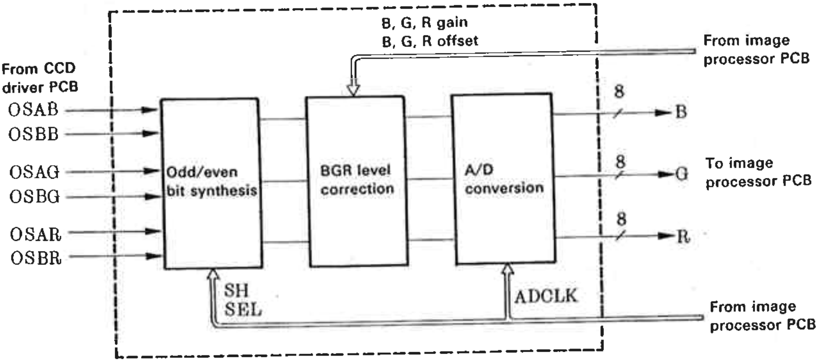
The analog image processor PCB performs the following in response to the output from the CCD.

- Odd/even bit synthesis
- BGR level correction
- A/D conversion

The image signals in six channels, each in odd or even bits, are sample-held by the sample hold signal (SH) and synthesized into image signals of three channels (B, G, R) by the select signal (SEL).

Thereafter, to correct the photo electrical conversion rate of each CCD (B, G, R), BGR level correction is performed according to the B, G, and R gain signals and B, G, and R offset signals.

The A/D conversion PCB operates based on the ADCLK signals and converts the B, G, and R image signals into digital signals of eight bits; it then sends the converted signals to the image processor PCB.



B, G, R gain
B, G, R offset
From image processor PCB
From CCD driver PCB
OSAB
OSBB
OSAG
OSBG
OSAR
OSBR
Odd/even bit synthesis
BGR level correction
A/D conversion
8
B
8
G
8
R
To image processor PCB
SH
SEL
ADCLK
From image processor PCB

Analog processor PCB

Figure 3-304

D. Digital Image Processor PCB

1. Outline

The digital image processor PCB is constructed as shown in Figure 3-305. The PCB converts the image signals coming from the analog image processor PCB; i.e., BGR → YMCBk.

At time of this conversion, the PCB also processes the image according to the instructions from the control panel for each data unit (data conversion).

The image data after this data conversion are then sent to the printer in the form of 8-bit video signals.

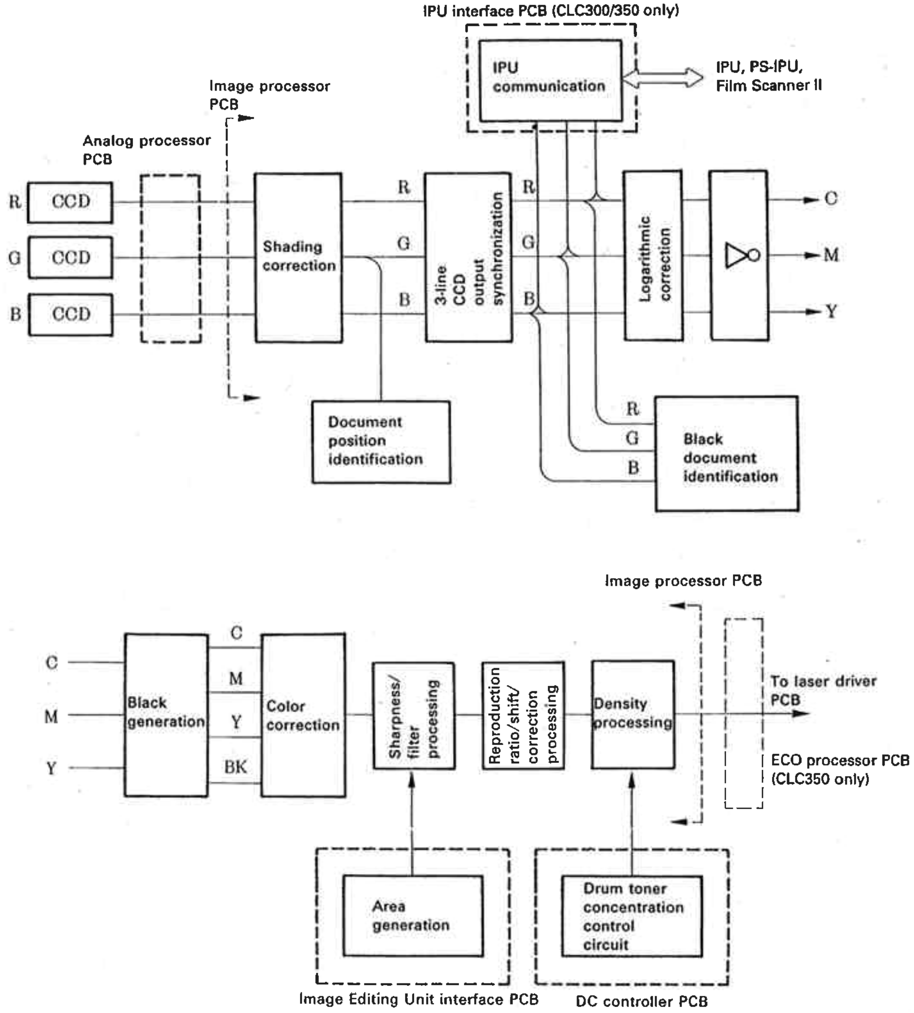

IPU interface PCB (CLC300/350 only)
IPU communication
IPU, PS-IPU, Film Scanner II
Image processor PCB
Analog processor PCB
R
G
B
CCD
CCD
CCD
Shading correction
R
G
B
3-line CCD output synchronization
R
G
B
Logarithmic correction
C
M
Y
Document position identification
R
G
B
Black document identification
Image processor PCB
C
M
Y
Black generation
C
M
Y
BK
Color correction
Sharpness/ filter processing
Reproduction ratio/shift/ correction processing
Density processing
To laser driver PCB
ECO processor PCB (CLC350 only)
Area generation
Drum toner concentration control circuit
Image Editing Unit interface PCB
DC controller PCB

Figure 3-305

2. Shading Correction

The output from the CCD will not always be uniform even of a document which is uniform in its density for the following reasons:

a. Each of the pixels of the CCD has a different sensitivity;
b. The lens transmits light to a different degree between its center and peripheral;
c. The scanning lamp has a different intensity between its center and ends; and
d. The scanning lamp is subject to deterioration.

What is known as shading is performed to correct these factors.

At the beginning of shading correction, the scanning lamp is turned ON to expose the standard white plate.

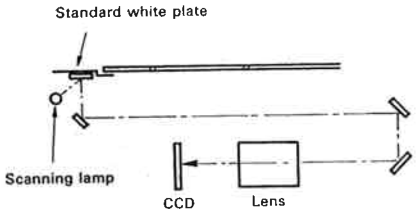


Figure 3-306

The CCD measures the light reflected by the standard white plate and outputs measurements.

The shading correction PCB then compares the measurements against the target of the standard white plate (see Note) and stores the difference as the shading correction value.

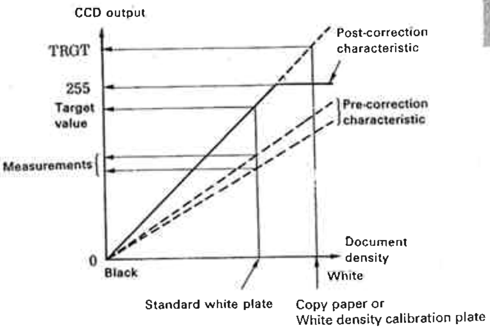


Figure 3-307 Shading Correction

The shading correction value is made use of to correct the data taken at the time the document is scanned, and measurements are taken each time the COPY START key is pressed.

Note:

i. In the case of the CLC200/300, the target value for the standard white plate is determined during WSMP based on the target value (TRGT) for the copy paper. The TRGT value may be varied in the service mode; TRGT (CLC200) for CCD, or POSI (CLC300) for SH-TRGT. You can adjust the color balance of the *light* areas by individually changing the settings of B, G, and R.

ii. In the case of the CLC350, the target value for the standard white plate is determined during WSMP based on the target value (TRGT) for the white density calibration plate. However, the TRGT value (POSI of SH-TRGT) is fixed, and cannot be varied. You can adjust the color balance of the *light* areas by varying the setting for OFST under COL-ADJ.

iii. In the case of the CLC300/350, you may adjust NEGA under SH-TRGT if the base film fails to correct the density or the color balance when making copies of a negative film.

iv. Scratches or dirt on the standard white plate cause excessive shading correction on the corresponding locations, resulting in vertical white streaks on copies. If the problem is not corrected after cleaning the standard white plate, you may change the point of shading correction by changing the setting of ADJ-S under ADJ-XY (CLC300/350 only).

3. Document Position

What is referred to as document position identification is a mechanism in which the document placed on the copyboard is checked for its size and position.

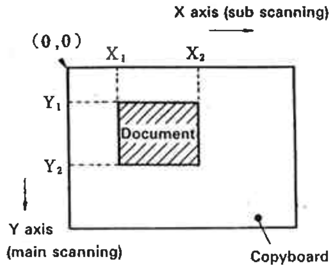


Figure 3-308

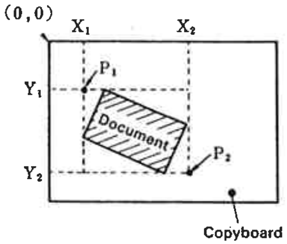


Figure 3-309

Figure 3-308 shows when a rectangular document is placed in parallel to the X (sub scanning) and Y (main scanning) directions; Figure 3-309 shows when a rectangular document is placed at an angle.

The back of the copyboard cover is not white unlike that of conventional copying machine; it is mirror-finished to prevent diffusion of light so that only the section over which a document is placed reflects the light from the scanning lamp to the CCD.

- Section covered with a document

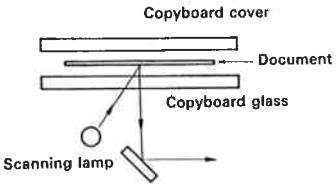


Figure 3-310

- Section not covered with a document

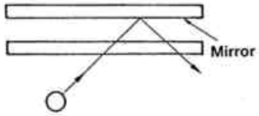


Figure 3-311

Most documents tend to be white-oriented; as such, the white section may be identified to represent the document.

In other words, a rectangular with a diagonal line drawn between the coordinates (Xmin/Ymin–Xmax/Ymax) may be identified as the document.

If a document is placed as in Figure 3-309, therefore, the rectangular with diagonal line running between P_1 and P_2 will be identified as the document.

Note:
Xmin: Stores the coordinates over the first change from black to white.
Xmax: Stores the coordinates over the last change from white to black.
Ymin: Stores the coordinates nearest the point of black to white change (main scanning).
Ymax: Stores the coordinates nearest the point of white to black change (main scanning).

All the above mechanisms enable identification of the position and size of the document, making possible such features as auto zoom, auto paper selection, and image shift.

Note:
The document position identification mechanism is not effective when a document is placed on the copyboard glass and copied with the RDF attached.

4. 3-Line CCD Output Synchronization

The CCD consists of three CCDs, each of which is covered with a red, green, or blue filter arranged next to each other. As such, the line image output by each of the CCDs has a discrepancy of about 1.1 mm (18 lines) with reference to the copyboard glass.

To correct the discrepancy, the image signals of R and G are stored for a while in line memories and sent out synchronized with the B image signal.

Note:
The delay of the B image signal is maximum at time of 400% enlargement; in this case, the R image signal is delayed for an equivalent of 144 lines and the G image signal, 72 lines.

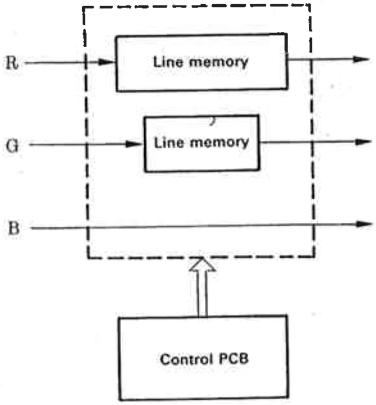

R
Line memory
G
Line memory
B
Control PCB

Figure 3-312

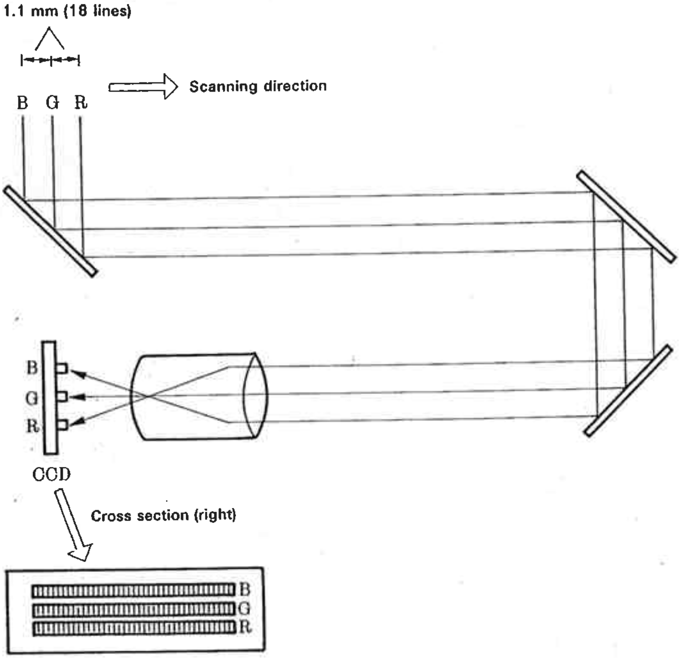

1.1 mm (18 lines)
Scanning direction
B G R
B
G
R
CCD
Cross section (right)
B
G
R

Figure 3-313

5. Black Document Identification

What is known as identification of black documents is a mechanism by which the document placed on the copyboard is identified as a color or black document.

The identification is performed at the same time as the scan made to check the presence/absence of a document and, if a black document is identified, a black mono copy is made.

When a black document is separated as to its color, it is assumed that its B, G, and R compositions are of the same ratio.

When color documents are separated, however, the ratio varies for each individual document.

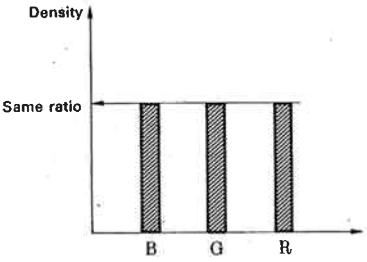


Figure 3-314 Black Document

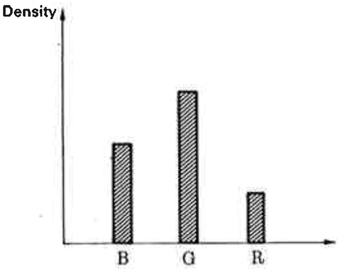


Figure 3-315 Color Document

If the B, G, and R components of a document are found to be of the same ratio upon separation, the document will be identified as a black document, and a black mono copy will be made as long as the auto color selection mechanism is activated.

> **Note:**
> A color document with a low density can sometimes be identified as a black text document because the prevention of opposite identification is given priority.

6. Logarithmic Correction/BGR→YMC Conversion

a. Logarithmic Correction

Figure 3-316 shows the relationship between the output of the CCD and density of a document as perceived by the eye.

The output of the CCD possesses characteristics which can be expressed by means of a linear line in relation to the intensity of the light reflected by the document; the density as perceived by the eye, however, is not necessarily so.

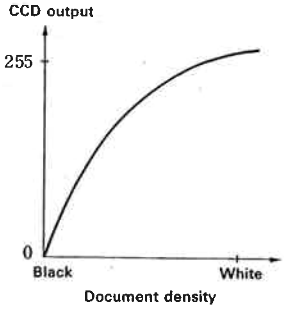


Figure 3-316

The logarithmic correction is performed to correct such discrepancies by means of level conversion as illustrated in Figure 3-317.

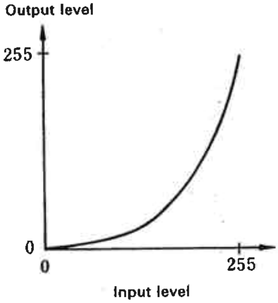


Figure 3-317 Logarithmic Correction

b. BGR→YMC Conversion

The properties of light (B, G, R) and the properties of light reflected by the toners (Y, M, C) are in a complementary relationship; Y, M, and C signals are generated by making use of this relationship.

Toner Light	Y	M	C
B	Absorbs.	Reflects.	Reflects.
G	Reflects.	Absorbs.	Reflects.
R	Reflects.	Reflects.	Absorbs.

Table 3-300

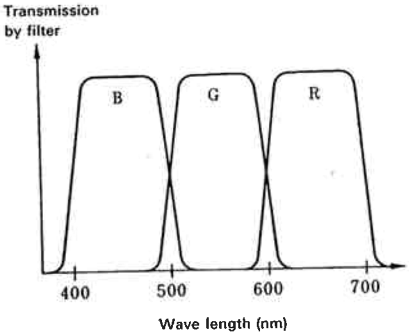


Figure 3-318

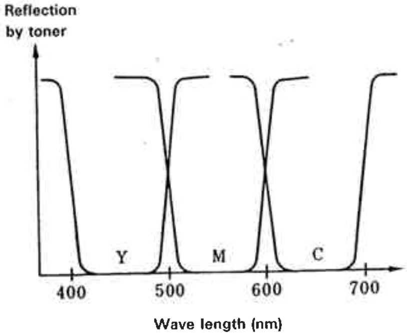


Figure 3-319

The light transmitted by each filter (B, G, R) of the CCD and the density of the document (Y, M, C) are in a complementary relationship; as such, level conversion is performed as shown in Figure 3-320 to generate Y, M, and C signals.

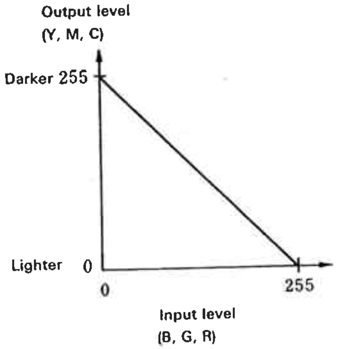


Figure 3-320 BGR→YMC Conversion

Note:
$Y=\overline{B}$, $M=\overline{G}$, $C=\overline{R}$

7. Bk Generation

The Bk (black) toner density signal is generated based on the Y, M, and C toner density signals.

Generally, black is reproduced by mixing Y, M, and C toners in equal amounts. The CLC200/300/350, however, uses an additional toner (Bk) to improve black reproduction.

A minimum value (Min) is obtained for each component (Y, M, C) for each pixel; the Bk component is then obtained by multiplying these minimum values (ßMin) by correction factor ß.

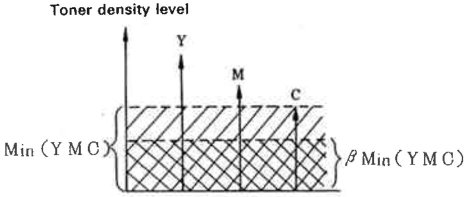


Figure 3-321

The outputs of the Bk generation unit (Yout, Mout, Cout, and Bkout), therefore, will be as follows:

Yout = Y – ßMin (YMC)
Mout = M – ßMin (YMC)
Cout = C – ßMin (YMC)
Bkout = ßMin (YMC)

8. Color Correction

In this process, the transmission characteristics of B, G, and R filters of the CCD and the reflection characteristics of Y, M, and C toners are corrected. What follows below employs the G filter and M toner by way of describing the mechanism.

An *ideal* G filter would transmit 100% of wave lengths between 500 nm and 600 nm and block out wave lengths 500 nm or less and 600 nm or more; in practice, however, such sections as a, b, and c in Figure 3-322 exist.

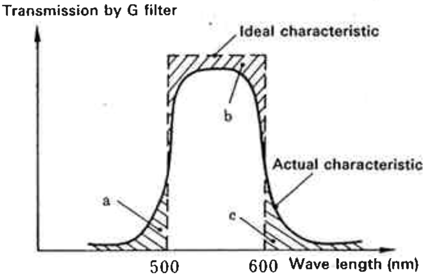


Figure 3-322

An *ideal* M toner, further, would absorb wave lengths between 500 nm and 600 nm (green) and reflect all wave lengths 500 nm or less and 600 nm or more; in practice, however, sections d, e, and f (Figure 3-323) exist.

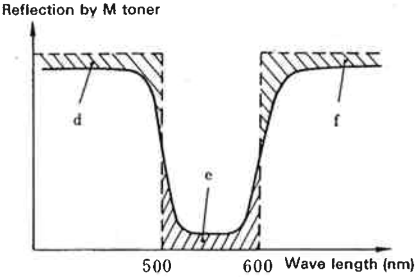


Figure 3-323

To correct the discrepancies, the following computations are made:

$$Y_{out} = (A_Y \times Y) - (B_Y \times M) - (C_Y \times C)$$
$$M_{out} = -(A_M \times Y) + (B_M \times M) - (C_M \times C)$$
$$C_{out} = -(A_C \times Y) - (B_C \times M) + (C_C \times C)$$

where,

- Y, M, and C are input signals to the color correction process.
- Yout, Mout, and Cout are output signals from the color correction process.
- A_Y, B_Y, and C_Y are correction factors for Y output.
- A_M, B_M, and C_M are correction factors for M output.
- A_C, B_C, and C_C are correction factors for C output.

9. Sharpness/Filter Processing

According to the degree of sharpness specified on the control panel, computations are performed so as to create crisp or soft images.

Figure 3-324a shows the output level noted when image data shown in Figure 3-324 are input and 'SHARPNESS WEAK' is specified.

When 'SHARPNESS WEAK' is specified, the gradation of the density is evened out to create soft images.

Figure 3-324b shows the output level noted when 'SHARPNESS STRONG' is specified; in this mode, the gradation of the density is emphasized to create crisp images.

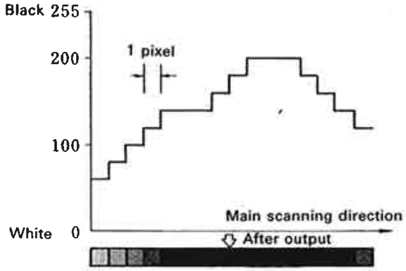


Figure 3-324 Input Level

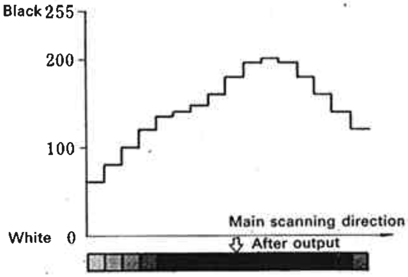


Figure 3-324a SHARPNESS WEAK Mode

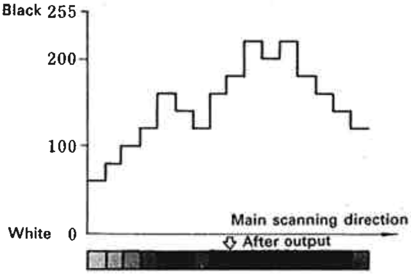


Figure 3-324b SHARPNESS STRONG Mode

10. Reproduction Ratio/Correction/ Shift Processing

a. Reproduction Ratio

① Horizontal (main scanning direction)
Image data are skipped in writing into or reading from memory (REDUCE); they are repeated when reading from memory (ENLARGE).

② Vertical (sub scanning direction)
The speed at which the document scanner (or copyboard) is moved is varied to change the width of the scan in relation to the document for each single pixel.

Table 3-301 shows how the CLC 200/300/350 processes differing reproduction ratios.

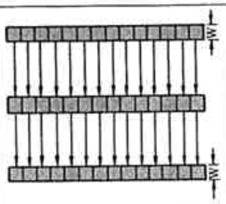
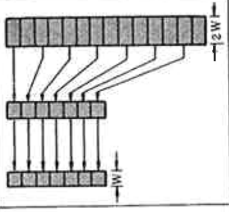
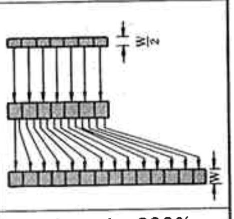
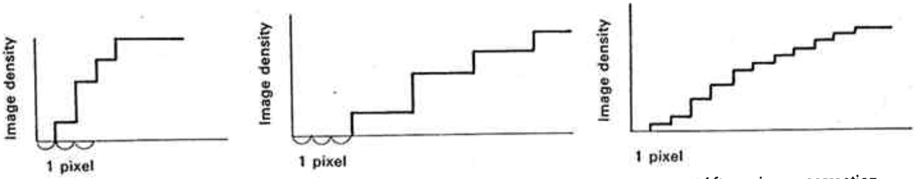
	DIRECT	REDUCE	ENLARGE
Document (image data) Line memory (writing) Copy (reading)			
Main scanning direction	All data are written into and read from memory as they are.	To reduce by 50%, for example, data are written every other unit.	To enlarge by 200%, for example, all data are written into memory as they are, but the same data units are read twice.
Sub scanning direction		The scanner is sped up to increase the width of the scan in relation to the document for each pixel.	The scanner is slowed down to decrease the width of the scan in relation to the document for each pixel.

Table 3-301

b. Correction for ENLARGE
So as to limit the difference in density between pixels, the image data are corrected.

Figure 3-325 shows image data of a document, those at time of ENLARGE and those after enlargement correction.

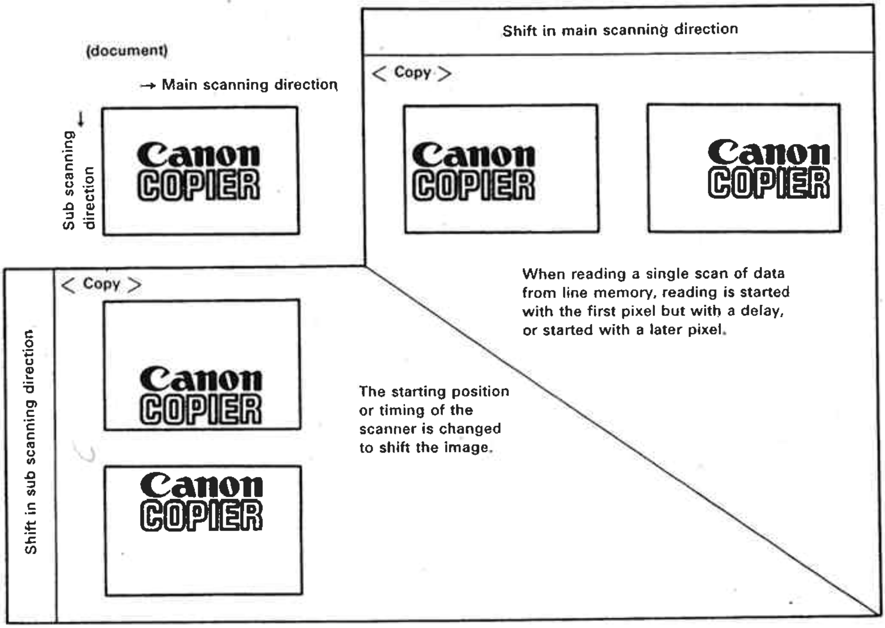


a. Document b. 300% ENLARGE c. After primary correction

Figure 3-325

c. Shift

Figures 3-326 through 3-328 show how an image is shifted in the main and sub scanning directions.


(document)
→ Main scanning direction
↓ Sub scanning direction
Canon COPIER
Shift in main scanning direction
< Copy >
Canon COPIER
Canon COPIER
Shift in sub scanning direction
< Copy >
Canon COPIER
Canon COPIER

When reading a single scan of data from line memory, reading is started with the first pixel but with a delay, or started with a later pixel.

The starting position or timing of the scanner is changed to shift the image.

Figure 3-326

Supplementary Notes

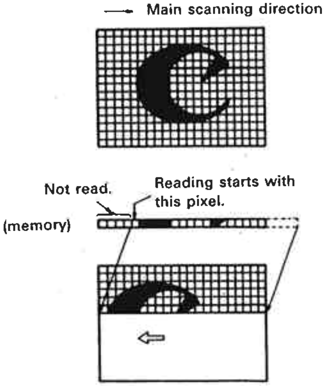

→ Main scanning direction
Not read.
Reading starts with this pixel.
(memory)
⇦

Figure 3-327

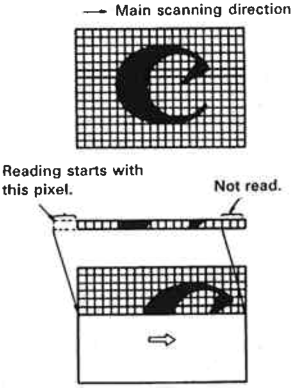

→ Main scanning direction
Reading starts with this pixel.
Not read.
⇨

Figure 3-328

The combination of moves in the main and sub scanning directions makes the following shifts possible.

① Center
From the size of the area to be moved and that of the copy paper, coordinates (Xm, Ym) that enable the margins at the top/bottom and left/right sides to be equal are computed for a shift to X1 and Y1.

Note:

$$Xm = \frac{Xmax - (X_2 - X_1)}{2}$$

$$Xm = \frac{Ymax - (Y_2 - Y_1)}{2}$$

② Let/Right Margin
The entire document (image) is movec to create a margin (for binding).

③ Pasting (w/ image editing unit only)
The image is enlarged or reduced and moved to the area specified by the editor.

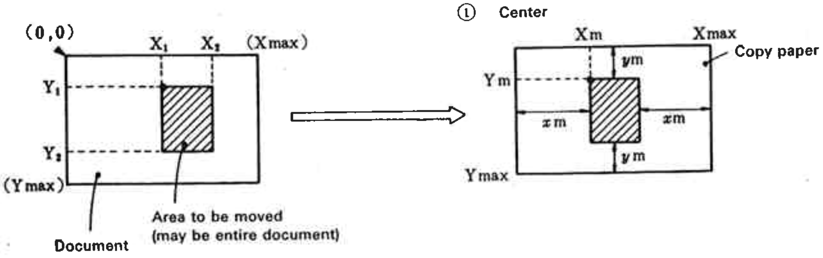

(0,0)
X₁
X₂
(Xmax)
Y₁
Y₂
(Ymax)
Document
Area to be moved
(may be entire document)
① Center
Xm
Xmax
Copy paper
Ym
ym
xm
xm
ym
Ymax

Figure 3-329 Shift to Center

d. Mirror Image

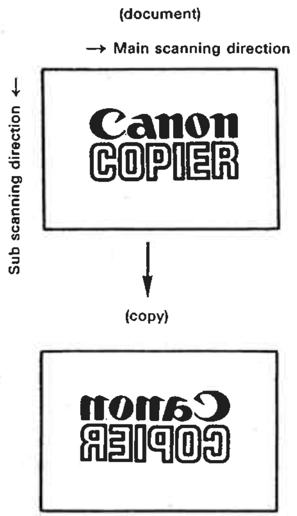

(document)
→ Main scanning direction
Sub scanning direction →
Canon
COPIER
(copy)

Figure 3-330

Mechanism

The data for a single scan is read from the RAM in reverse order to create a mirror image.

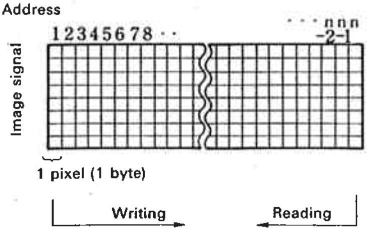

Address
12345678 · ·
· · · n n n
-2-1
Image signal
1 pixel (1 byte)
Writing
Reading

Figure 3-331

e. Image Repeat

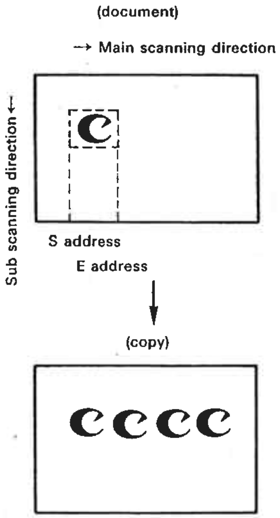

(document)
→ Main scanning direction
Sub scanning direction →
S address
E address
(copy)

Figure 3-332

Mechanism

In reading data for a single scan from the RAM, the start address (S) and end address (E) are specified; thereafter, the data are read starting with S address and, when E address is reached, the data are read once again starting with S address. This whole process is repeated for image repeats.

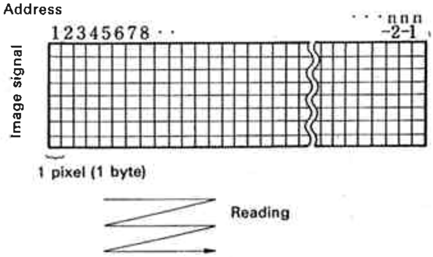

Address
12345678 · ·
· · · n n n
-2-1
Image signal
1 pixel (1 byte)
Reading

Figure 3-333

11. Concentration Processing

The correction curve representing the concentration processing mechanism changes in respect of the following:

a. COPY CONCENTRATION key on the control panel
b. Color balance set on the control panel
c. Color balance set in the service mode (COL-ADJ)
d. Service mode light area offset adjustment (OFST of COL-ADJ; CLC350 only)
e. AE measurements
f. Character
g. Measurements of drum toner; CLC300/350 only (See p. 3-64.)

Depending on items a through d above, the curve changes to assume dark or light lines shown in Figure 3-334. In the character mode, on the other hand, the curve assumes a shape that will darken characters (text) without fogging; see Figure 3-335.

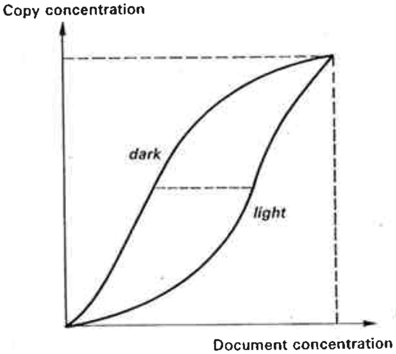


Figure 3-334

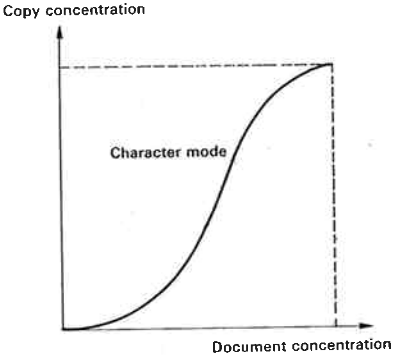


Figure 3-335

IV. EXPOSURE SYSTEM (laser)

A. Outline

The laser exposure system consists of the laser unit, which emits laser beams, and the laser scanner, which scans the photosensitive drum. The laser scanner is equipped with a 10-facet mirror.

The video signals (VDOO through 7) from the image processor PCB are converted into laser intensity signals (LD) inside the laser driver PCB, and the semiconductor laser inside the laser unit generates laser beams according to the LD.

The laser beam so generated is turned into a parallel beam having an oval cross section and then converted by the cylindrical lens into a parallel beam in the form of a flat band.

The laser beam converted into this form is reflected by the 10-facet mirror rotating at a constant speed, and the reflected beam moves through the focus lens and hits the photosensitive drum.

Since the photosensitive drum rotates at a constant speed and the laser beam scans the photosensitive drum at a constant speed, proper electrostatic potential images are formed on the drum.

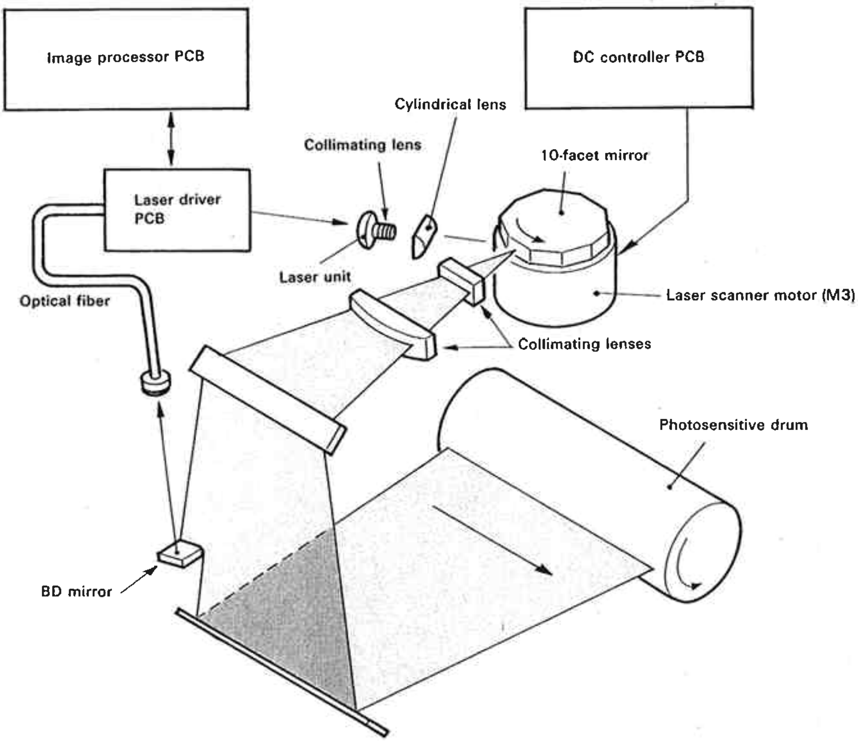


Image processor PCB
DC controller PCB
Cylindrical lens
Collimating lens
10-facet mirror
Laser driver PCB
Laser unit
Optical fiber
Laser scanner motor (M3)
Collimating lenses
Photosensitive drum
BD mirror

Figure 3-400

B. Sequence of Operations

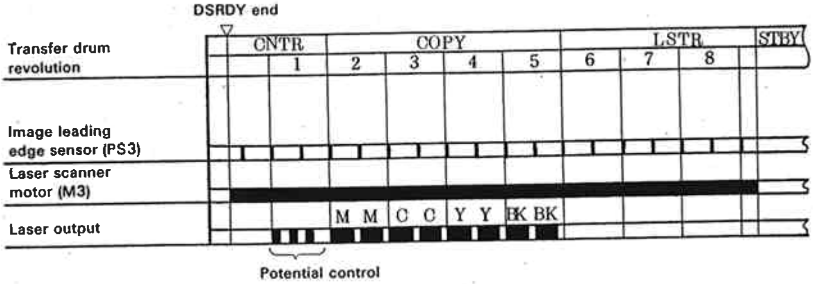


Figure 3-401

C. Generation of BD Signal

The BD signal, which is used to synchronize the video signal for each scan by the laser beam, is generated by the beam detection signal generation circuit of the laser driver PCB based on the laser beam reflected by the BD mirror found in the optical path.

With the BD signal as reference, the image processor PCB reads image signals from the CCD, processes them, and sends the resulting video signals to the laser driver PCB.

The laser driver PCB outputs such video signals as laser intensity control signals in sequence.

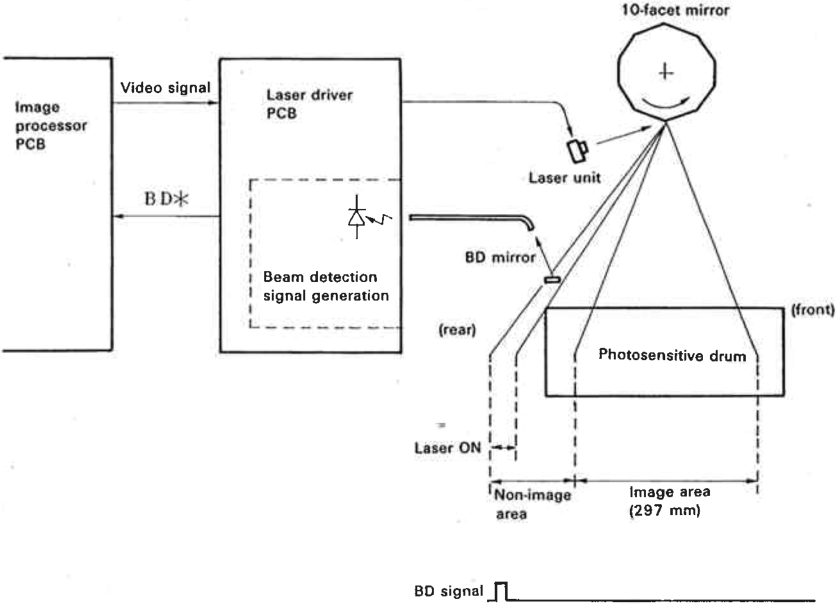

10-facet mirror
Image processor PCB
Video signal
Laser driver PCB
BD*
Laser unit
Beam detection signal generation
BD mirror
(rear)
(front)
Photosensitive drum
Laser ON
Non-image area
Image area (297 mm)
BD signal

Figure 3-402

D. Laser Driver PCB

Figure 3-403 shows the circuit which converts the video signals (VDO0 through 7) from the image processor PCB into laser intensity control signals to drive the semiconductor laser.

The 8-bit video signals from the image processor PCB are D/A converted and, thereafter, sent to the laser intensity control circuit to drive the laser accordingly.
For adjustment of VR501 through VR506, see SERVICE MODES.

Note:
L-ON✻ (laser ON signal). '1' during laser power adjustment and horizontal test printing, i.e., the laser is ON.
L-OFF✻ (laser OFF signal). '0' when the front door is open, i.e., the laser is OFF.

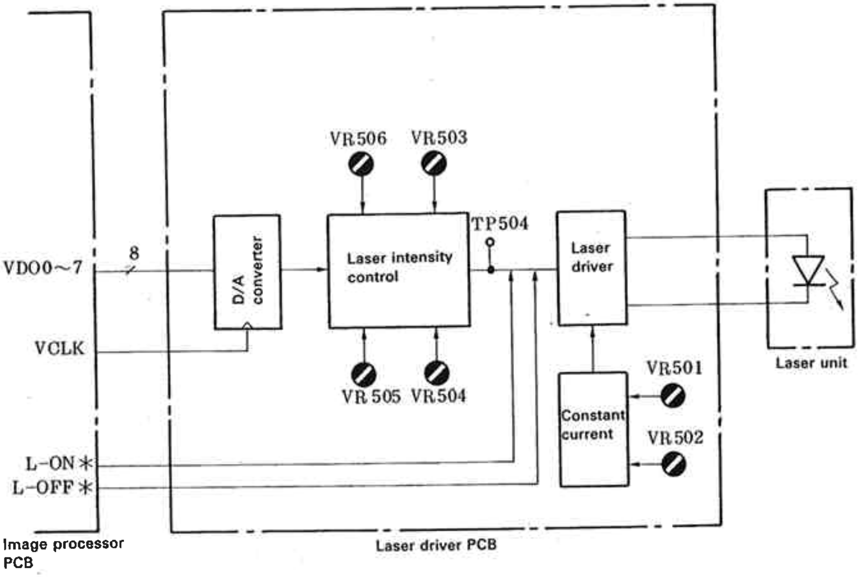

VR506
VR503
TP504
VDO0~7
8
D/A converter
Laser intensity control
Laser driver
VCLK
VR505
VR504
VR501
Constant current
VR502
Laser unit
L-ON✻
L-OFF✻
Image processor PCB
Laser driver PCB

Figure 3-403

E. Temperature Control for Laser Unit

The PCB is equipped with a mechanism which controls the temperature of the laser unit so as to stabilize the laser intensity.

The laser unit is provided with a thermistor and heater. The area around the laser unit is cooled by the cooling fan (FM6) as long as the power is ON; and, when the temperature drops below the specified value, the heater is turned ON.

The temperature is controlled, unlike that of the drum, only when the power is ON.

If the temperature fails to reach the specified value within ten minutes after the power is turned ON or if the temperature reaches an error value, 'E120' will be indicated on the control panel.

Specified temperature	45°C
High temperature error	50°C
Low temperature error	40°C*

* If it reaches 40°C and then falls below 40°C, or until it reaches the specified value, 'READY TO COPY' message will not be indicated.

Further, the READY TO COPY message (CLC200) will be held back and SALT (CLC300/350) will not be executed until the specified temperature is reached.

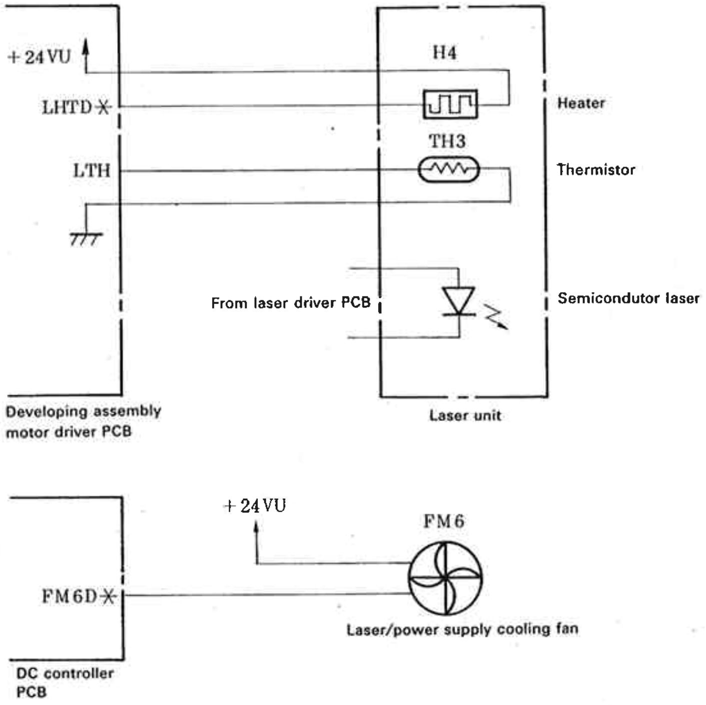

+24VU
LHTD
LTH
H4
Heater
TH3
Thermistor
From laser driver PCB
Semicondutor laser
Developing assembly motor driver PCB
Laser unit
+24VU
FM6
FM6D
Laser/power supply cooling fan
DC controller PCB

Figure 3-404

F. Laser Scanner Motor

The laser scanner motor (M3) is a brushless DC motor with a built-in rotation speed control circuit. It rotates at a constant speed when the DC controller PCB causes the laser scanner motor drive signal (LSMD✱) to go '0'.

If the speed of rotation of the motor deviates for some reason, the motor causes the scanner motor ready signal (LSMRDY✱) to go '1' and indicates 'E110' on the control panel.

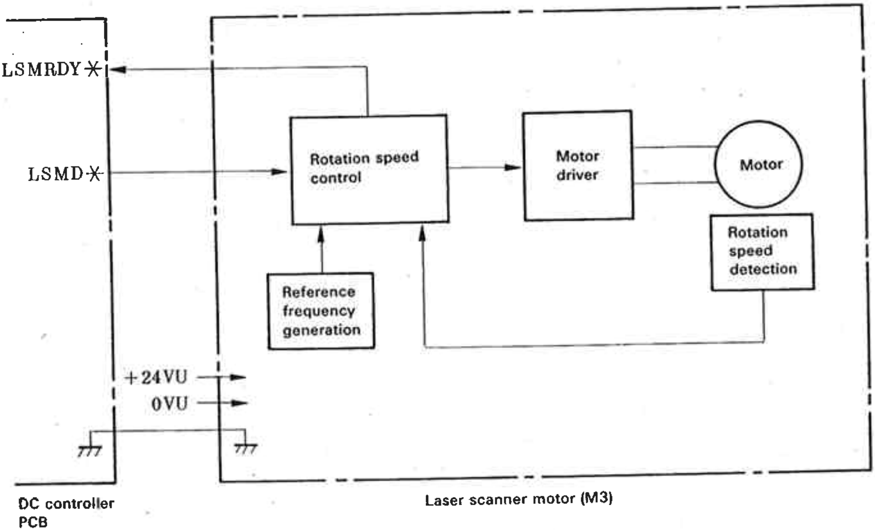

LSMRDY✱
LSMD✱
Rotation speed control
Motor driver
Motor
Rotation speed detection
Reference frequency generation
+24VU
0VU
DC controller PCB
Laser scanner motor (M3)

Figure 3-405

V. IMAGE FORMATION SYSTEM

A. Outline

The image formation system of the CLC 200/300/350 consists of the following mechanisms:

- Control of drum surface potential
  - Control of primary corona unit grid bias
  - Control of developing bias
- Control of drum toner conecntration; CLC300/350 only
  - Correction of target contrast potential
  - Correction of gradation
- Control of primary corona current
- Control of attraction corona current
- Control of transfer corona current
- Control of separation corona current
- Control of internal static eliminator corona current
- Control of external static eliminator corona current
- Control of pre-cleaning corona current
- Control of photosensitive drum temperature
- Control of primary corona cleaning
- Developing assembly/photosensitive drum cleaning unit
  - Developing assembly shift
  - Color toner concentration detection
  - Black toner concentration detection
  - Measurement of drum toner correction
  - Toner supply
  - Photosensitive drum cleaning

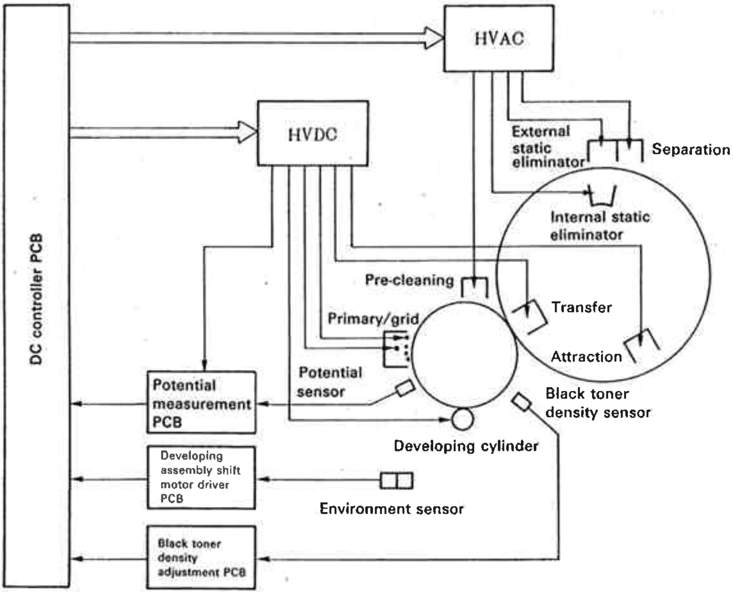

HVAC
HVDC
DC controller PCB
External static eliminator
Separation
Internal static eliminator
Pre-cleaning
Transfer
Primary/grid
Attraction
Potential sensor
Black toner density sensor
Potential measurement PCB
Developing cylinder
Developing assembly shift motor driver PCB
Environment sensor
Black toner density adjustment PCB

Figure 3-500

B. Sequence of Operations (image formation system)

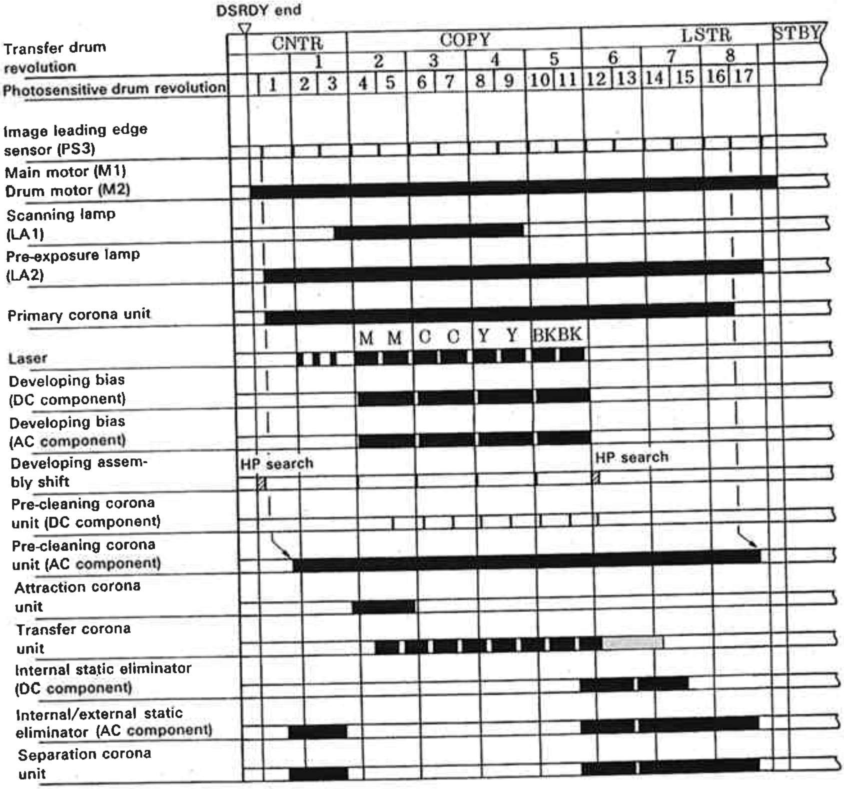


Figure 3-501 A4/LTR, 2 Copies, 4-Color, Potential Control ON

▨: In the case of the CLC200/300, the transfer high voltage is turned ON after transfer operation to ensure better static elimination from the transfer drum sheet. In the case of the CLC350, on the other hand, the high voltage is not turned ON for the following reason:
When charging occurs for transfer, the transfer drum sheet is attracted to the photosensitive drum. Since the CLC350 is capable of making two-sided copies, turning on the high-voltage would cause the fixing oil on the transfer drum sheet to move to the photosensitive drum, causing cleaning faults on the photosensitive drum.

C. Image Stability Control

1. Outline

A change in the development characteristics is a factor that influences copy quality.

Such a change in turn is brought about by the following:

a. Change in drum sensitivity (VL).
b. Change in discharge from primary corona unit.

A change in the development characteristics is mainly triggered by a change in the toner characteristics due to the environment (teperature/humidity) and deterioration of or dirt on parts.

To ensure stable output of copy images in the presence of these factors, the CLC200 is equipped with a drum surface potential control function and the CLC300/350, with both drum surface potential control function and drum toner density control function.

The drum surface potential control function is used to control the target contrast potential based on the drum surface potential measured by the potential sensor and the condition around the developing assembly.

The drum toner density control function found in the CLC300/350, on the other hand, corrects the target contrast potential for each color and the gradation based on the density on the drum of each of the toners (MCYBk).

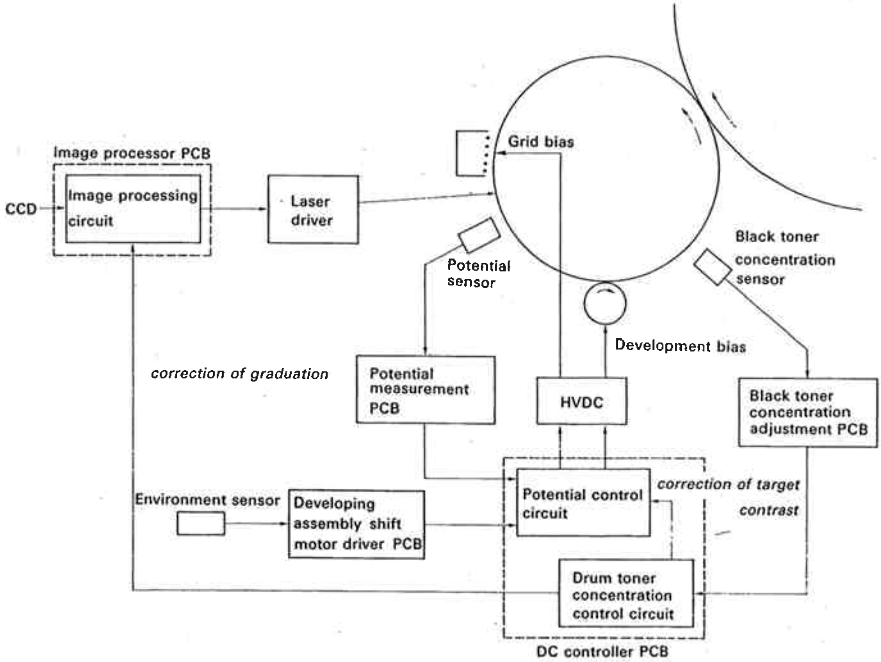


Image processor PCB
CCD
Image processing circuit
Laser driver
Grid bias
Potential sensor
Black toner concentration sensor
Development bias
correction of graduation
Potential measurement PCB
HVDC
Black toner concentration adjustment PCB
Environment sensor
Developing assembly shift motor driver PCB
Potential control circuit
correction of target contrast
Drum toner concentration control circuit
DC controller PCB

Figure 3-502

D. Drum Surface Potential Control

1. Control Mechanism

The potential is controlled by controlling the grid bias of the primary corona unit and development bias.

a. Setting the Target Contrast Potential

The machine is equipped with an environment sensor, which reads the environment in which the machine is installed.

The provision is made in consideration of the changes in the environment, which affects the characteristics of the developer and, ultimately, the density of the copy.

Based on the data obtained by the environment sensor, the environment contrast potential (VcontENV) is set.

The correction value* obtained based on the service mode and drum toner concentration control settings is then added to the environment contrast potential to determine the target contrast potential (Vcont).

* Differs for each color.

Vcrct:	adjustment of target value (variable in service mode)
Vtmpr:	adjustment of target value upon installation or replacement of developer (variable in service mode)
VcontSALT:	correction value obtained by drum toner concentration control; CLC300/350 only (p. 3-63)

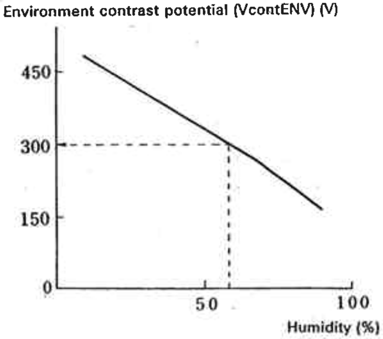
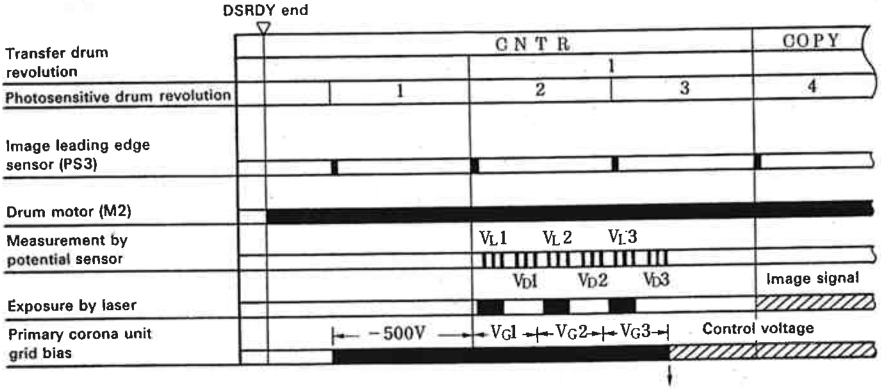


Figure 3-503


DSRDY end
Transfer drum revolution
Photosensitive drum revolution
CNTR
COPY
1
1
2
3
4
Image leading edge sensor (PS3)
Drum motor (M2)
Measurement by potential sensor
VL1
VL2
VL3
VD1
VD2
VD3
Image signal
Exposure by laser
Primary corona unit grid bias
-500V
VG1
VG2
VG3
Control voltage

At the time, the DC controller PCB determines the control value of the DC component of the development bias as well; however, the development bias is not applied until immediately before the drum is shifted and brought into contact with the drum.

Figure 3-504

b. Measuring the Surface Potential

Measurements are taken of the dark area potential (V_D) and light area potential (V_L) ocurring when the grid bias (V_G) of the primary corona unit is set to a given potential; V_D is read when the laser is OFF and V_L, when ON.

V_G1	V_G2	V_G3
-300 V	-500 V	-800 V

Table 3-500

When the surface potential is measured, the grid bias is set to V_G1; V_D1/V_L1 are readings obtained at this time. Next, V_G2 is set, and V_D2/V_L2 are read.

Likewise, the grid bias is set to V_G3, and V_D3/V_L3 are read.

Based on such V_D/V_L, a graph similar to the one in Figure 3-505 is prepared.

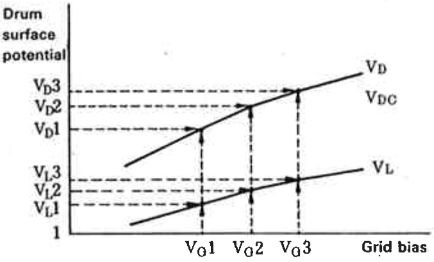


Figure 3-505

The measurements are timed as follows:

- During drum toner density control; CLC300/350 only
- During the first copy run after the power is turned ON
- During the first copy run five minutes or more after preceding potential control
- During the first copy run after removal of a jam

c. Setting the Grid Bias and Development Bias

So as to make the copies fog-free, a line is drawn for the development bias (V_{DC}) at points obtained by adding +140 to V_D.

Next, the point at which the potential (contrast potential) between V_{DC} and V_L of Figure 3-506 and the target contrast potential are identical is found.

Lastly, from that point, the target values of the grid bias and development bias are obtained.

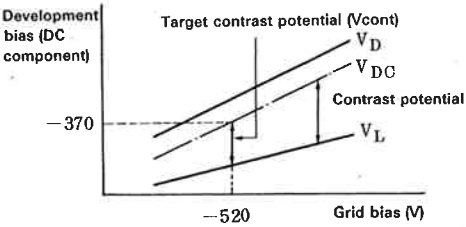


Figure 3-506

Note:
The contrast potential can be set manually in seven steps.

The seven settings may be switched over in the service mode.

Each of these potential settings is a fixed potential and cannot be varied in the field.

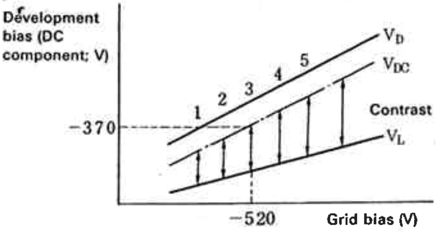


Figure 3-507

2. Potential Measurement Circuit

Figure 3-510 is a block diagram of the potential measurement circuit.

A charge equivalent to the drum surface potential is induced on the electrode inside the sensor and sent in the form of an AC voltage by opening and closing of the chopper to the pre-amplifier inside the sensor; after amplification, it is sent to the filter/gain adjustment circuit inside the potential measurement PCB.

In the filter/gain adjustment circuit, the AC signal sent from the pre-amplifier of the sensor is rid of electrical noise and is further amplified; thereafter, it is sent to the sync clamp circuit by way of a photo coupler.

The sync clamp circuit identifies the drum surface potential as of positive or negative based on the AC signal coming from the filter/gain adjustment circuit and a synchronization signal coming from the synchronization adjustment circuit.

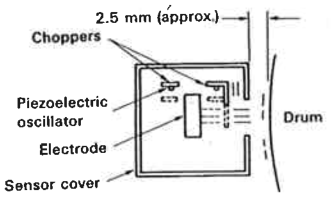

2.5 mm (approx.)
Choppers
Piezoelectric oscillator
Electrode
Sensor cover
Drum

Figure 3-508 Cross Section of Sensor

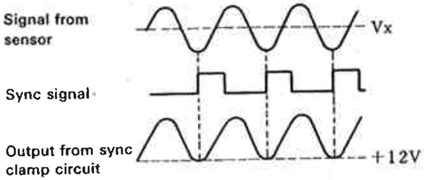

Signal from sensor
Vx
Sync signal
Output from sync clamp circuit
+12V

Figure 3-509 Surface Potential Higher Than Sensor Bias

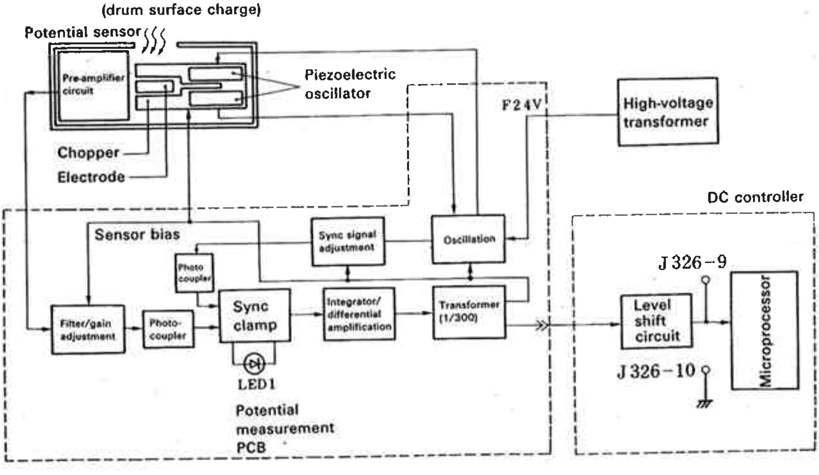

(drum surface charge)
Potential sensor
Pre-amplifier circuit
Piezoelectric oscillator
Chopper
Electrode
F24V
High-voltage transformer
DC controller
Sensor bias
Sync signal adjustment
Oscillation
Photo coupler
Filter/gain adjustment
Photo-coupler
Sync clamp
Integrator/differential amplification
Transformer (1/300)
LED1
Potential measurement PCB
J326-9
Level shift circuit
J326-10
Microprocessor

Figure 3-510

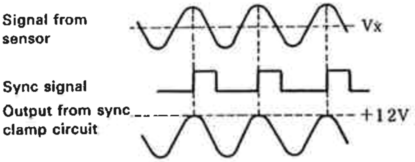


Figure 3-511 Surface Potential Lower Than Sensor Bias

The output of the sync clamp circuit is integrated by the integrator circuit and, after amplification, applied to the transformer. Based on the signal, the output of the transformer is varied between 0 V and -600 V and applied to the sensor in the form of a sensor bias; at the same time, it is lowered to about 1/300 and sent to the level shift circuit inside the DC controller PCB.

Signals of 0V reference is converted to signals of 1V reference while they are amplified (to about 1/255).

The level shift circuit output signal (analog) is sent to the microprocessor of the DC controller as it is.

a. Checking

① Checking If LED1 Goes ON
LED1 remains ON at all times while power is present. If it fails to go ON, the F24V power supply may be out or the potential measurement unit is faulty.

Note:
The potential sensor is normal as long as LED1 is ON.

② Making Use of Check Pins
Use J326-9 and J326-10 of the DC controller PCB in evaluating the potential measurement unit.

3. Primary Corona Unit Grid Bias Control

a. Outline

Figure 3-512 shows the circuit that controls the grid bias of the primary corona unit.

The circuit, based on the data obtained from potential control, is activated by the grid bias level control signal (HVGBC) from the DC controller PCB.

The control signal from the DC controller PCB is sent to the high-voltage transformer.

By this signal, the grid bias of the primary corona unit is controlled.

The circuit, further, provides the potential measurement PCB with power.

b. Mechanism

The high-voltage transformer (T1) for the grid bias remains ON at all times as long as the power switch is ON. When HVGBC falls below 16 V, a grid bias suited to the value is generated.

The grid bias goes OFF when HVGBC exceeds 16 V.

The grid bias, further, is maintained constant to suit HVGBC by using the voltage of the grid bias as feedback.

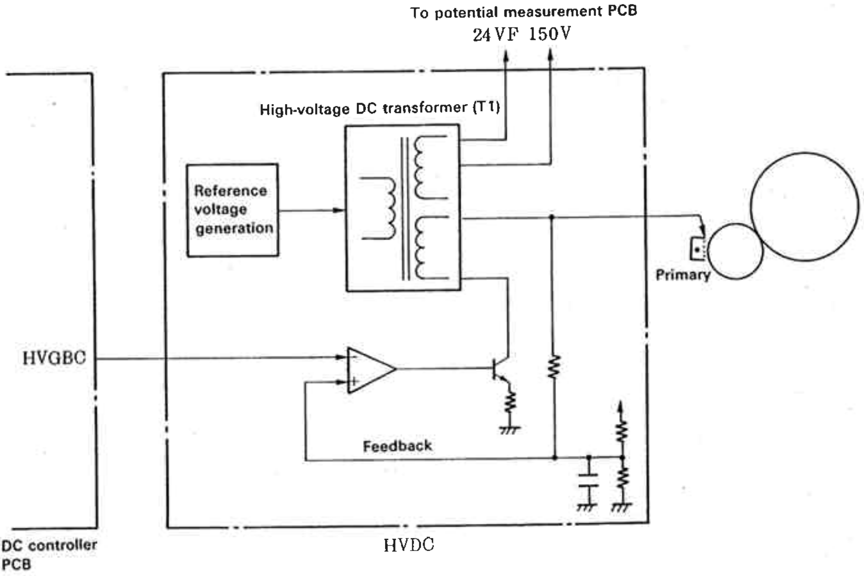

To potential measurement PCB
24VF 150V
High-voltage DC transformer (T1)
Reference voltage generation
Primary
HVGBC
Feedback
DC controller PCB
HVDC

Figure 3-512

4. Development Bias Control Circuit

a. Outline

Figure 3-513 shows the circuit that controls the development bias and has the following functions:

- Turns the AC component of the development bias ON and OFF.
- Turns the DC component of the development bias ON and OFF.
- Controls the voltage level of the DC component of the development bias.

b. Mechanism

① Turning the AC Bias ON and OFF

- The bias is controlled by the development bias AC component ON signal (HVBAC✻).

HVBAC✻ = 0
↳ Square wave oscillation circuit goes ON.
  ↳ Oscillation control circuit goes ON.
    ↳ T4 goes ON.

The condition provides the developing cylinder with an AC bias.

② Turning the DC Bias ON and OFF and Controlling the Level

The development bias DC component is controlled by the development bias DC level control signal (HVBDCC) based on the data obtained by potential control. The variable pulse width oscillation circuit does not generate pulses if the development bias DC level control signal (HVBDCC) is 16 V or more.

- HVBDCC is 16 V or more.
  ↳ Variable pulse width oscillation circuit goes OFF.
    ↳ T5 goes OFF.
- HVBDCC is less than 16 V.
  ↳ Variable pulse width oscillation circuit goes ON.
    ↳ T5 goes ON.

The condition provides the developing cylinder with a DC bias suited to HVBDCC.

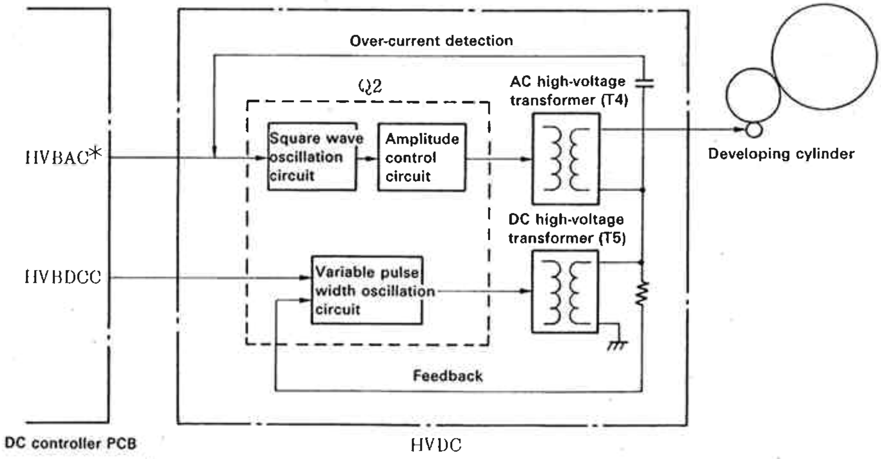

Over-current detection
Q2
AC high-voltage transformer (T4)
Square wave oscillation circuit
Amplitude control circuit
HVBAC*
Developing cylinder
DC high-voltage transformer (T5)
HVBDCC
Variable pulse width oscillation circuit
Feedback
DC controller PCB
HVDC

Figure 3-513

E. Drum Toner Concentration Control (CLC300/350 only)

1. Outline

In this mechanism (SALT*), the black toner concentration sensor measures the concentration of toner (each color) to correct the target contrast potential and gradation. The mechanism is activated after warm-up operations of the fixing roller and the laser assembly.

The functions of the mechanism, in order of discussion, are as follows:

- Correction of target contrast potential
- Correction of gradation
- Conditions for control

* Stabilizing Application for Linearity of Tone.

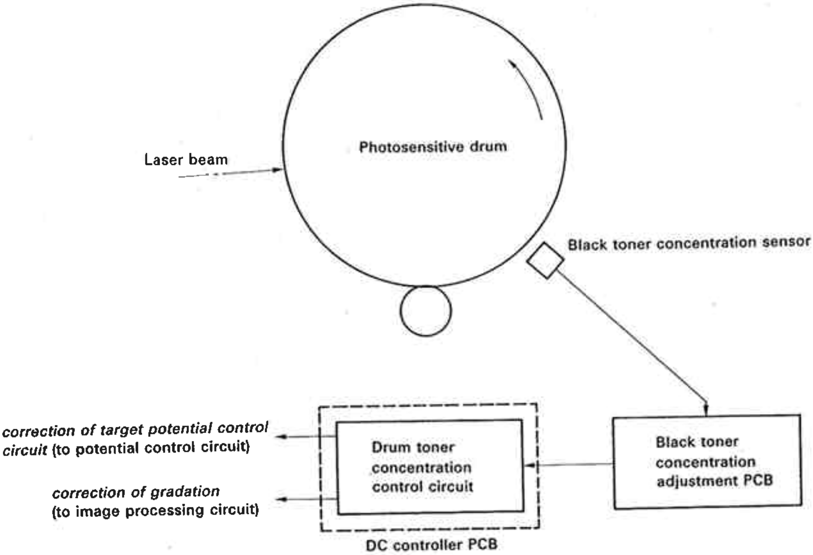

Laser beam
Photosensitive drum
Black toner concentration sensor
correction of target potential control circuit (to potential control circuit)
correction of gradation (to image processing circuit)
Drum toner concentration control circuit
Black toner concentration adjustment PCB
DC controller PCB

Figure 3-514

2. Correction of Target Contrast Potential

a. Outline

In principle, the target contrast potential is set by the environmental sensor. In the mechanism under discussion, the concentration of toner (for each color) representing images on the photosensitive drum is read by the black toner concentration sensor to obtain a correction value of the target contrast potential for each color based on the difference between the reading and the target density. This way, the solid density on the drum can be kept within the optimum range.

b. Sequence of Operation

1 Potential control is executed using the target contrast potential without correction; VcontENV + Vcrct + Vtmpr.
2 The M toner image is developed, and its concentration is read by the black toner concentration sensor.
3 The degree of soiling found on the sensor window is corrected; see p. 3-88.
4 The M correction value (VcontMSALT) is obtained for the target contrast potential based on the difference between the reading and the target potential.
5 Operations 2, 3, and 4 are repeated for each toner (CYBk).
6 The transfer drum is cleaned.

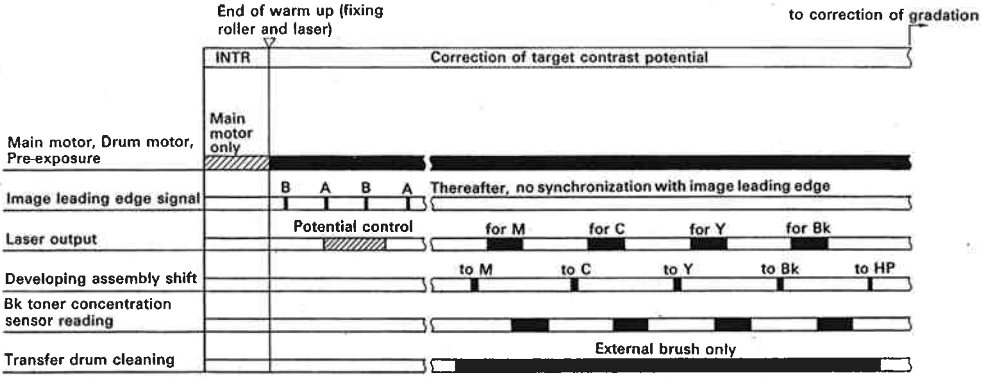

End of warm up (fixing roller and laser)
to correction of gradation
INTR
Correction of target contrast potential
Main motor, Drum motor, Pre-exposure
Main motor only
Image leading edge signal
B
A
B
A
Thereafter, no synchronization with image leading edge
Laser output
Potential control
for M
for C
for Y
for Bk
Developing assembly shift
to M
to C
to Y
to Bk
to HP
Bk toner concentration sensor reading
Transfer drum cleaning
External brush only

Figure 3-515

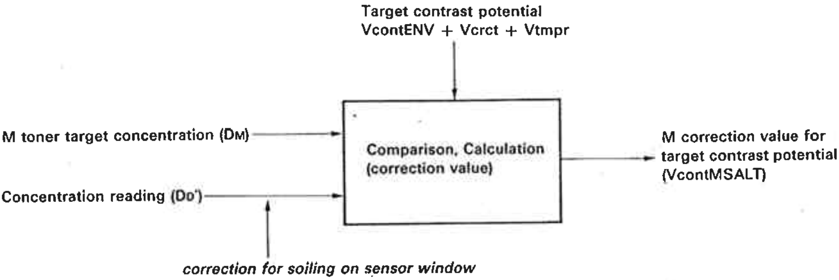

Target contrast potential
VcontENV + Vcrct + Vtmpr
M toner target concentration (DM)
Concentration reading (Do')
Comparison, Calculation (correction value)
M correction value for target contrast potential (VcontMSALT)
correction for soiling on sensor window

Figure 3-516

3. Correction of Gradation

a. Outline

A halftone (multiple gradation) image of each color is actually developed, and correction is made so that the output of the laser and the concentration of toner on the drum will be proportional to each other.

b. Sequence of operation

1. Potential control is executed using the target contrast potential, which is a value obtained by adding VcontSALT used to correct the target contrast potential; *VcontENV + Vcrct + Vtmpr + VcontSALT.
2. The M toner image is developed in different halftone gradations, and the black toner concentration senso reads the concentration.
3. The degree of soiling found on the sensor window is corrected
4. The concentration processing circuit on the image processor is controlled based on the gradation characteristics obtained.
5. Operations 2 and 3 are repeated for each toner (CYBk).
6. The transfer drum is cleaned.

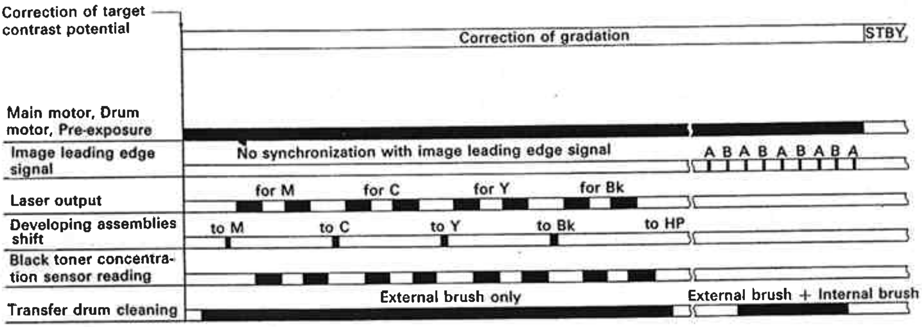

Correction of target contrast potential
Correction of gradation
STBY
Main motor, Drum motor, Pre-exposure
Image leading edge signal
No synchronization with image leading edge signal
A B A B A B A B A
Laser output
for M
for C
for Y
for Bk
Developing assemblies shift
to M
to C
to Y
to Bk
to HP
Black toner concentration sensor reading
Transfer drum cleaning
External brush only
External brush + Internal brush

Figure 3-517

4. Conditions for Control

Correction of the target contrast potential and gradation is executed only if the temperature of the fixing roller is 74°C (100°C) or less when the machine is switched ON; the value in parentheses represents the temperature of the fixing roller actually measured.

If any of the errors given below exists, correction will not be executed and the most recent correction value for the target contrast potential and the most recent correction curve for gradation will be used.

ERR may be checked using SALT under FUNCTION in service mode; be sure to check it if an error code is indicated.

a. The dirt on the black toner concentration sensor is less than specified; see p. 3-88.
- ERR=X1XXXX (measured at the beginning of SALT control and during control rotation (CNTR) after a press on the COPY START key.)

b. The solid toner concentration on the photosensitive drum is less than specified.
- Measurements are taken during correction of the target contrast potential.
- ERR = XXXXXX1 (Bk)
  XXXXX1X (Y)
  XXXX1XX (C)
  XXX1XXX (M)

c. The gradation correction data has an error.
- Measurements are taken during correction of gradation.
- ERR = 1XXXXX

Note:
Correcting ERR

a. Dirt on Black Toner Concentration Sensor
Cause
build-up of dirt on sensor, or wrong setting for SGNL-K of ATR-VR
Remedy
1) Wipe the window of the sensor using lint-free paper moistened in alchohol*.
* Use alcohol with high purity.
* Do not dry wipe it to prevent spread of dirt.
2) Re-set SGNL-K (VR981) and REF-K (VR982) under ATR-VR.
3) Switch the machine OFF and then ON.

b. Faulty Solid Density
Cause
deterioration of resolution
Remedy
Check the assembly for the color suffering the error for the cause.

c. Correction Data.
Cause
deterioration of photosensitive drum, or residual memory
1) Disengage the transfer drum, change its orientation with the photosensitive drum, and execute the control mechanism once again (SALT — ACT = 1).
2) Set TEST PRINT as follows if the error persists after step 1) above, and make a copy using cyan (mono).
- PGTYPE = 5 (full half-tone)
- DENS-C = 50 (density 50)

If irregularity (250mm pitch) attributed to the photosensitive drum is still noted, replace the drum.

F. Primary Corona Current Control

1. Outline

Figure 3-518 shows the circuit that controls the primary corona unit and has the following functions:

- Turns the primary corona current ON and OFF.

The output of the primary corona current is controlled constant to prevent effects of the environment on the corona discharge.

2. Mechanism

The primary corona current is turned ON and OFF by the primary corona current ON signal (HVPR✻).

- HVPR✻ = 0
  - └→Variable width pulse oscillation circuit goes ON.
    - └→High-voltage transformer for primary corona goes ON.
- HVPR✻ = 1
  - └→Variable width pulse oscillation circuit goes OFF.
    - └→High-voltage transformer for primary corona goes OFF.

The level of the primary corona current is fed back to the variable width pulse oscillator circuit, where it is compared against the reference voltage and kept constant.

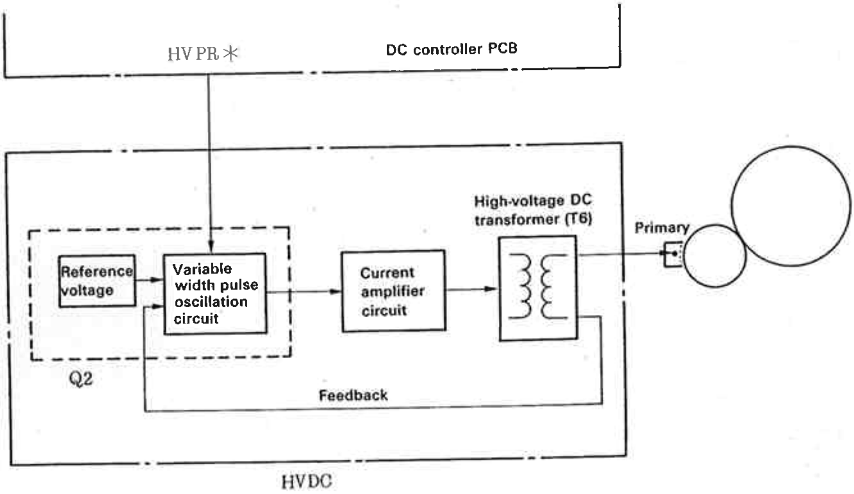

HVPR✻
DC controller PCB
High-voltage DC transformer (T6)
Primary
Reference voltage
Variable width pulse oscillation circuit
Current amplifier circuit
Q2
Feedback
HVDC

Figure 3-518

G. Attraction Corona Potential Control

1. Outline

Figure 3-519 shows the circuit that controls the attraction corona and performs the following in response to the attraction corona current level control signal (HVATC).

- Turns the attraction corona current ON and OFF.
- Controls the attraction corona current level.

The DC controller sends HVATC of a suitable level according to the humidity read by the environment sensor and the type of copy paper used (plain/OHP).

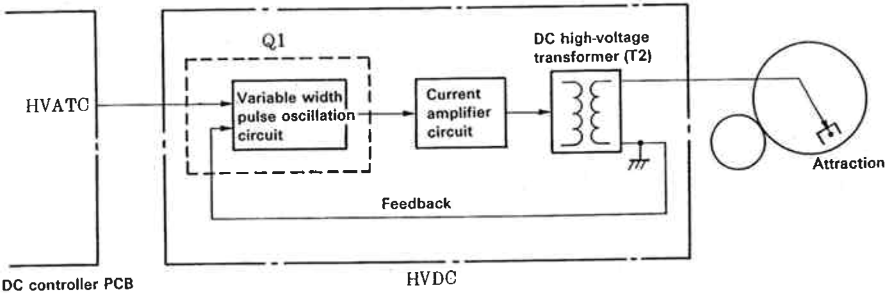
Like the primary corona current, the attraction corona current is controlled to a constant value to suit HVATC.

2. Mechanism

The variable width pulse oscillation circuit does not generate pulses if HVATC is 16 V or more.

- HVATC is 16 V or more.
  - └→ Variable width pulse generator circuit goes OFF.
    - └→ T2 goes OFF.
- HVATC is less than 16 V.
  - └→ Variable width pulse generator circuit goes ON.
    - └→ T2 goes ON.

The condition generates a corona current which suits HVATC.



HVATC
Q1
Variable width pulse oscillation circuit
Current amplifier circuit
DC high-voltage transformer (T2)
Attraction
Feedback
DC controller PCB
HVDC

Figure 3-519

H. Transfer Corona Current Control

1. Outline

Figure 3-520 shows the circuit that controls the transfer corona and performs the following to suit the transfer corona current level control signal (HVTRC).

- Turns the transfer corona current ON and OFF.
- Controls the transfer corona current level.

The DC controller sends HVTRC of a suitable level according to the humidity read by the environment sensor, the number of transfer operations per copy, and the type of copy paper (plain/OHP).

The variation is intended to ensure correct transfer when toners of different colors (maximum of four) are transferred for a single copy; i.e., the transfer corona current is increased for each successive transfer.

Like the primary corona current, the transfer corona current is controlled to a constant value to suit HVTRC.

2. Mechanism

The variable width oscillation circuit does not generate pulses if HVTRC is 16 V or more.

- HVTRC is 16 V or more.
  └→ Variable pulse width oscillation circuit goes OFF.
    └→ T3 goes OFF.
- HVATC is less than 16 V.
  └→ Variable pulse width oscillation circuit goes ON.
    └→ T3 goes ON.

This condition generates a corona current suited to HVTRC.

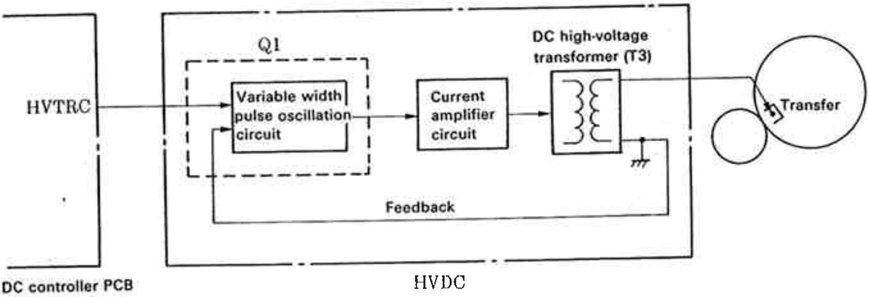

Q1
DC high-voltage transformer (T3)
HVTRC
Variable width pulse oscillation circuit
Current amplifier circuit
Transfer
Feedback
DC controller PCB
HVDC

Figure 3-520

I. Separation Corona Current Control

1. Outline

Figure 3-521 shows the circuit that controls the separation corona and turns the AC component of the separation corona current ON and OFF to suit the separation corona current AC component ON signal (HVSPAC✳).

2. Turning the AC Component ON and OFF

The AC component is controlled to suit HVSPAC✳.

HVSPAC✳ = 0

└→ Square wave generator circuit goes ON.

  └→ T4 goes ON.

The condition generates an AC component of the separation corona current.

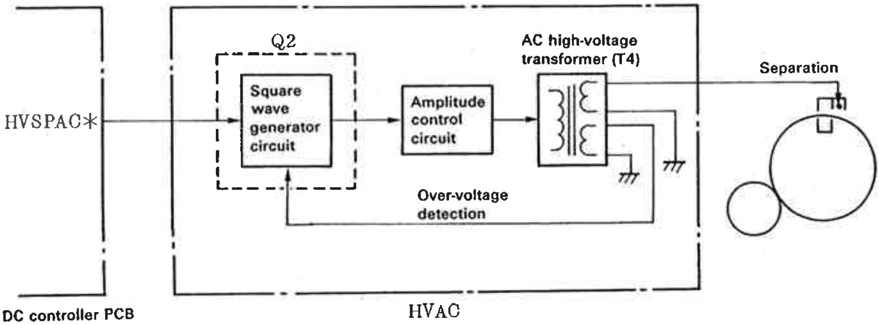

Q2
AC high-voltage transformer (T4)
Separation
HVSPAC✳
Square wave generator circuit
Amplitude control circuit
Over-voltage detection
DC controller PCB
HVAC

Figure-3-521

J. Internal Static Eliminator Corona Current Control

1. Outline

Figure 3-522 shows the circuit that controls the internal static eliminator AC/DC corona; it performs the following in response to the static eliminator corona current AC component ON signal (HVSEAC*) and internal corona current DC component level control signal (HVISEDCC).

- Turns the internal static eliminator corona current AC component ON and OFF.
- Turns the internal static eliminator corona current DC component ON and OFF.
- Controls the internal static eliminator corona current DC level.

Like primary corona current, the internal static eliminator-corona current DC component is controlled to a constant current to suit HVISEDCC.

2. Turning the AC Component ON and OFF

The mechanism is controlled based on HVSEAC*.

HVSEAC* = 0

└→Square wave generator circuit goes ON.

  └→T4 goes ON.

The condition generates AC coronas.

3. Turning the DC Component ON and OFF and Controlling the Level

If HVISEDCC is less than 8 V, the variable width pulse oscillation circuit does not generate pulses.

- HVISEDCC is less than 8 V.
  └→Variable width pulse generator circuit goes OFF.
    └→T3 goes OFF.
- HVISEDCC is 8 V or more.
  └→Variable width pulse generator circuit goes ON.
    └→T3 goes ON.

The condition generates DC components suited to HVISEDCC.

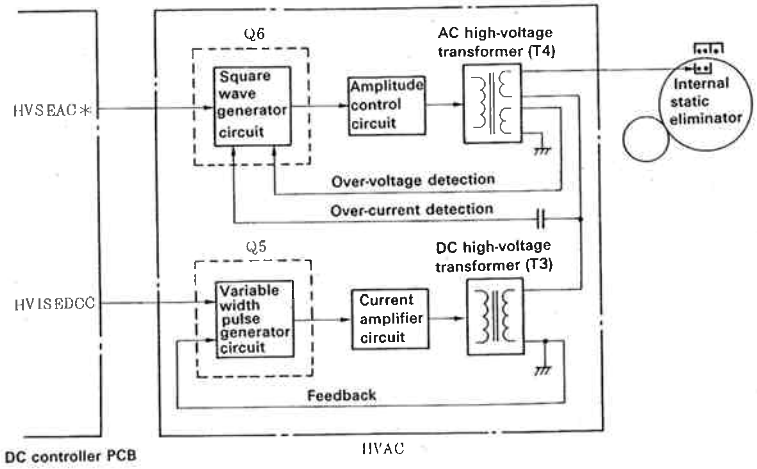

Q6
AC high-voltage transformer (T4)
HVSEAC*
Square wave generator circuit
Amplitude control circuit
Internal static eliminator
Over-voltage detection
Over-current detection
Q5
DC high-voltage transformer (T3)
HVISEDCC
Variable width pulse generator circuit
Current amplifier circuit
Feedback
DC controller PCB
HVAC

Figure-3-522

K. External Static Eliminator Corona Current Control

1. Outline

Figure 3-523 shows the circuit that controls the external static eliminator AC/DC corona; it performs the following in response to the static eliminator corona current AC component ON signal (HVSEAC*) and external corona current DC component level control signal (HVESEDCC).

- Turns the external static eliminator corona current AC component ON and OFF.
- Turns the external static eliminator corona current DC component ON and OFF.
- Controls the external static eliminator corona current DC level.

Like primary corona current, the external static eliminator corona current DC component is controlled to a constant current to suit HVESEDCC.

2. Turning the AC Component ON and OFF

The mechanism is controlled based on HVSEAC*.

HVSEAC* = 0

└→ Square wave generator circuit goes ON.

  └→ T4 goes ON.

The condition generates AC coronas.

3. Turning the DC Component ON and OFF and Controlling the Level

If HVESEDCC is less than 8 V, the variable width pulse oscillation circuit does not generate pulses.

- HVESEDCC is less than 8 V.

  └→ Variable width pulse generator circuit goes OFF.

    └→ T1 goes OFF.

- HVESEDCC is 8 V or more.

  └→ Variable width pulse generator circuit goes ON.

    └→ T1 goes ON.

The condition generates DC components suited to HVISEDCC.

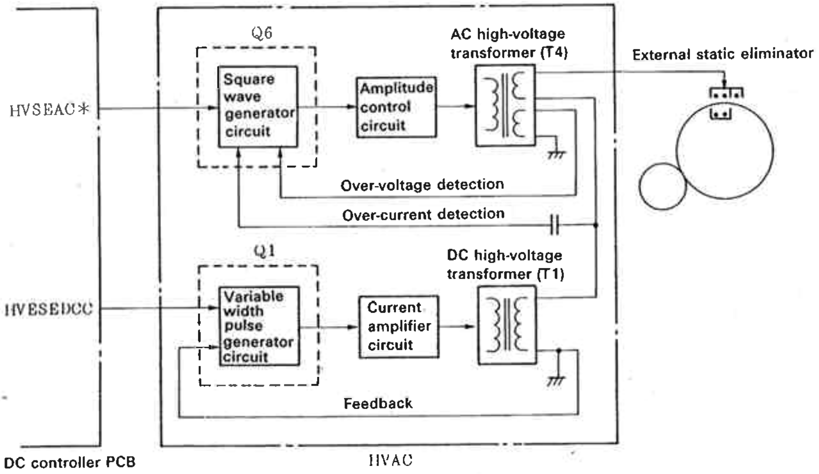

Q6
AC high-voltage transformer (T4)
External static eliminator
Square wave generator circuit
Amplitude control circuit
HVSEAC*
Over-voltage detection
Over-current detection
Q1
DC high-voltage transformer (T1)
HVESEDCC
Variable width pulse generator circuit
Current amplifier circuit
Feedback
DC controller PCB
HVAC

Figure-3-523

L. Pre-Cleaning Corona Current Control

1. Outline

Figure 3-524 shows the circuit that controls the pre-cleaning corona and performs the following in response to the pre-cleaning corona current AC component ON signal (HVPCAC✻) and pre-cleaning corona current DC component level control signal (HVPCDCC).

- Turns the pre-cleaning corona current AC component ON and OFF.
- Turns the pre-cleaning corona current DC component ON and OFF.
- Controls the pre-cleaning corona current DC component level.

Like the primary corona current, the pre-cleaning corona current DC component is controlled to a constant current to suit HVPCDCC.

2. Turning the AC Component ON and OFF

The AC component is controlled to suit HVPCAC✻.

HVPCAC✻ = 0
└→Square wave generator circuit goes ON.
  └→T4 goes ON.

The condition generates an AC component of the pre-cleaning corona current.

3. Turning the DC Component ON and OFF and Controlling the Level

The variable width pulse oscillation circuit does not generate pulses if HVPCDCC is less than 8 V.

- HVPCDCC is less than 8 V.
  └→Variable width pulse generator circuit goes OFF.
    └→T2 goes OFF.
- HVSPDCC is 8 V or more.
  └→Variable width pulse generator circuit goes ON.
    └→T2 goes ON.

The condition generates DC components suited to HVPCDCC.

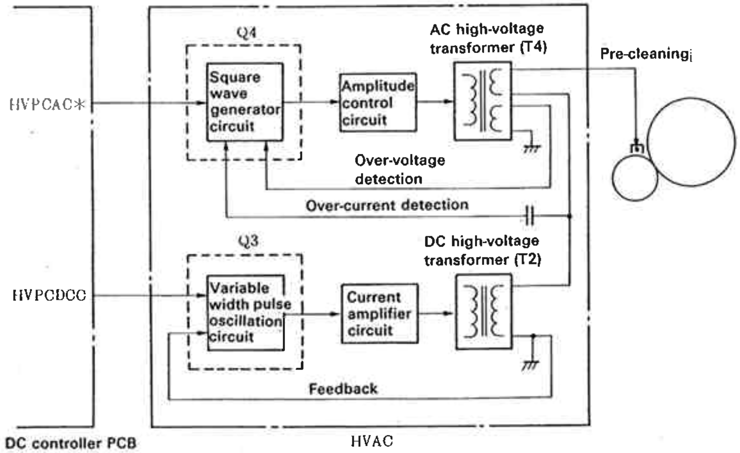

Q4
AC high-voltage transformer (T4)
Pre-cleaning
HVPCAC✻
Square wave generator circuit
Amplitude control circuit
Over-voltage detection
Over-current detection
Q3
DC high-voltage transformer (T2)
HVPCDCC
Variable width pulse oscillation circuit
Current amplifier circuit
Feedback
DC controller PCB
HVAC

Figure-3-524

M. Photosensitive Drum Temperature Control

1. Outline

The sensitivity of the photosensitive drum changes according to the environment (temperature/humidity) in which the machine is installed.

The drum heater (25 W) inside the drum is intended to keep the temperature around the drum to a specified value, thereby preventing changes in the sensitivity.

2. Mechanism

The developing assembly motor driver PCB is supplied with power as long as the power plug is connected to the outlet regardless of whether the power switch is ON or OFF.

The temperature around the drum is checked by the thermistor located nearby at all times and communicated to the microprocessor. When the temperature is below the specified value, the drum heater is supplied with power by way of SSR.

If the temperature reaches an error value, the control panel indicates 'E062'.

specified value .... 33°C (26°C)
high-temperature error value .... 50°C (50°C)
low-temperature error value .... 25°C (—)

Note:
1. The value in parentheses is when the temperature read by the environment sensor is below a specific level; in such cases, low-temperature errors are not detected.
2. Low-temperature errors are detected when the temperature drops below the low-temperature error value after it has reached a specific level.

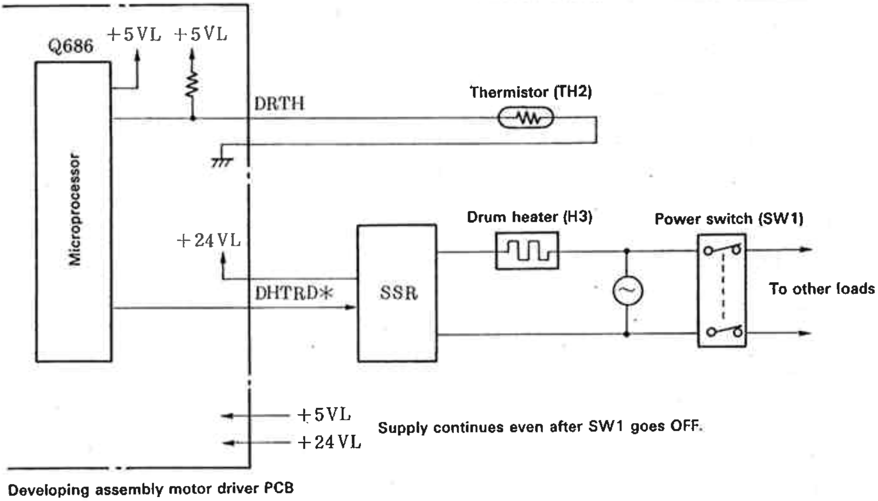

Q686
+5VL
+5VL
Microprocessor
DRTH
Thermistor (TH2)
+24VL
DHTRD*
SSR
Drum heater (H3)
Power switch (SW1)
To other loads
+5VL
+24VL
Supply continues even after SW1 goes OFF.
Developing assembly motor driver PCB

Figure 3-525

N. Primary Corona Wire Cleaning Control

1. Outline

The primary corona wire is automatically cleaned under the following conditions:

① The temperature of the fixing assembly is 74°C (100°C) or less when the power is turned ON; the value in parentheses represents the temperature of the fixing roller actually measured.

② When primary corona wire cleaning is performed in the service mode.

③ When the scanner has made 2000 scans since the most recent cleaning operation; if 4-color, 500 copies.

2. Mechanism

The primary corona wire cleaning motor (M8) is rotated for about 25 seconds; the cleaning felt moves forward and comes into contact with the rear.

Thereafter, the motor is rotated in reverse for about 25 seconds; the cleaning felt moves in reverse and comes into contact with the front.

The protection resistor serves to control the over-current, which occurs when the cleaning felt comes into contact with the front or rear.

Note:
M8FW = 1, M8RV = 0
Forward.
M8FW = 0, M8RV = 1
Reverse.

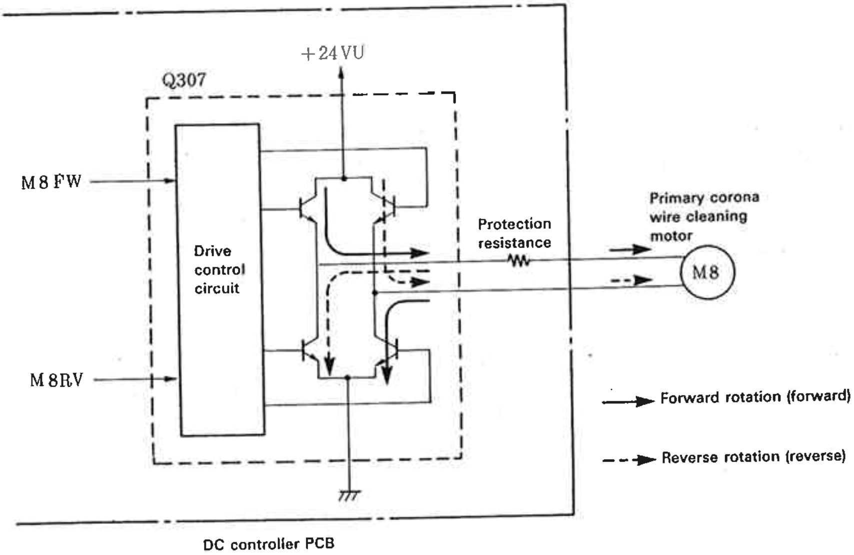

+24VU
Q307
M8FW
M8RV
Drive control circuit
Protection resistance
Primary corona wire cleaning motor
M8
Forward rotation (forward)
Reverse rotation (reverse)
DC controller PCB

Figure 3-526

O. Developing Assembly/Photosensitive Drum Cleaning Unit

1. Outline

The four developing assemblies for four colors are mounted on the developing assembly base.

The developing assembly base serves to move the developing assemblies in parallel or engage them using the drive from the developing assembly motor (M4) so that the developing assembly of the specified color is brought opposite the photosensitive drum.

When the photosensitive drum and developing assembly come face to face, the developing cylinder clutches (CLs 1, 2, 3, 4) of the developing assemblies go ON to relay the drive of the developing cylinder motor (M6) to the developing cylinder.

The concentration of the toner inside the developing assembly is checked by the toner concentration detection circuit when the developing assembly comes opposite the photosensitive drum. When the concentration of the toner drops below a specified level, the toner supply clutches (CLs 6, 7, 8, 9) go ON to supply toner from the hopper.

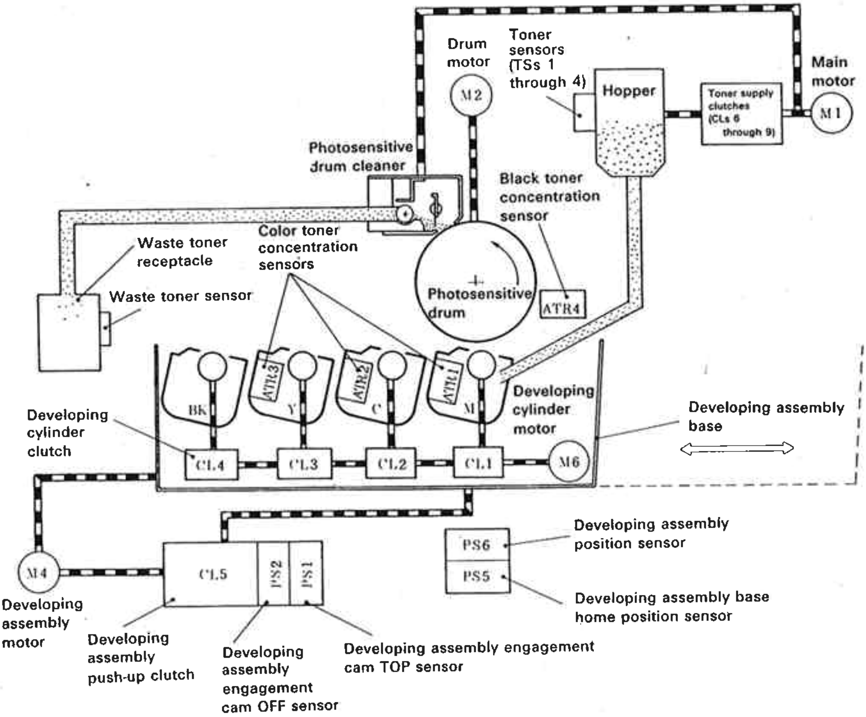
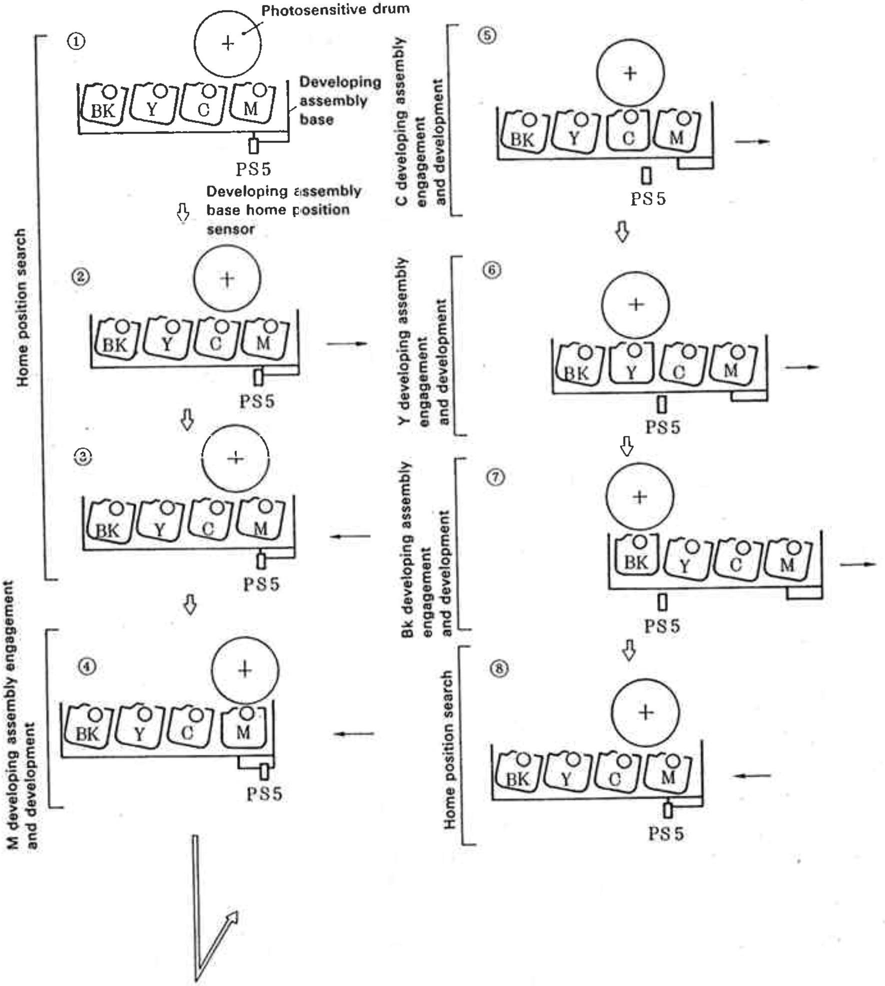

Drum motor
M2
Toner sensors (TSs 1 through 4)
Hopper
Toner supply clutches (CLs 6 through 9)
Main motor
M1
Photosensitive drum cleaner
Black toner concentration sensor
Color toner concentration sensors
Waste toner receptacle
Waste toner sensor
Photosensitive drum
ATR4
BK
Y
C
M
ATR3
ATR2
ATR1
Developing cylinder motor
Developing assembly base
Developing cylinder clutch
CL4
CL3
CL2
CL1
M6
Developing assembly position sensor
PS6
PS5
Developing assembly base home position sensor
M4
CL5
PS2
PS1
Developing assembly motor
Developing assembly push-up clutch
Developing assembly engagement cam OFF sensor
Developing assembly engagement cam TOP sensor

Figure 3-527

2. Moving the Developing Assemblies

a. Outline

All developing assemblies of the CLC200/300/350 are mounted on the developing assembly base; when a 4-color copy is made, the base moves in parallel to select the correct developing assembly as illustrated below (always M → C → Y → Bk).


Photosensitive drum
Developing assembly base
PS5
Developing assembly base home position sensor
①
②
③
④
⑤
⑥
⑦
⑧
BK
Y
C
M
Home position search
M developing assembly engagement and development
C developing assembly engagement and development
Y developing assembly engagement and development
Bk developing assembly engagement and development
Home position search

Sometimes, two sheets of paper (A, B sides) are placed on the transfer drum; see p. 3-21.

If the sheets are placed closely, a move to a different assembly except that located right next to it may not be made in time; e.g., from the M developing assembly to the Y developing assembly or from the Bk developing assembly to the M developing assembly.

For such a case, the sheets are placed on the transfer drum with a delay equivalent to a single copy side.

b. Move to the Point of Development

The distance between the home position of the developing assembly base and the point of development of each color is kept in memory by the microprocessor on the developing assembly motor driver PCB, and the developing assembly motor (M4) is rotated for an equivalent of that distance.

The rack of the developing assembly base receives the rotation of M4 to move the developing assembly base to the point of development.

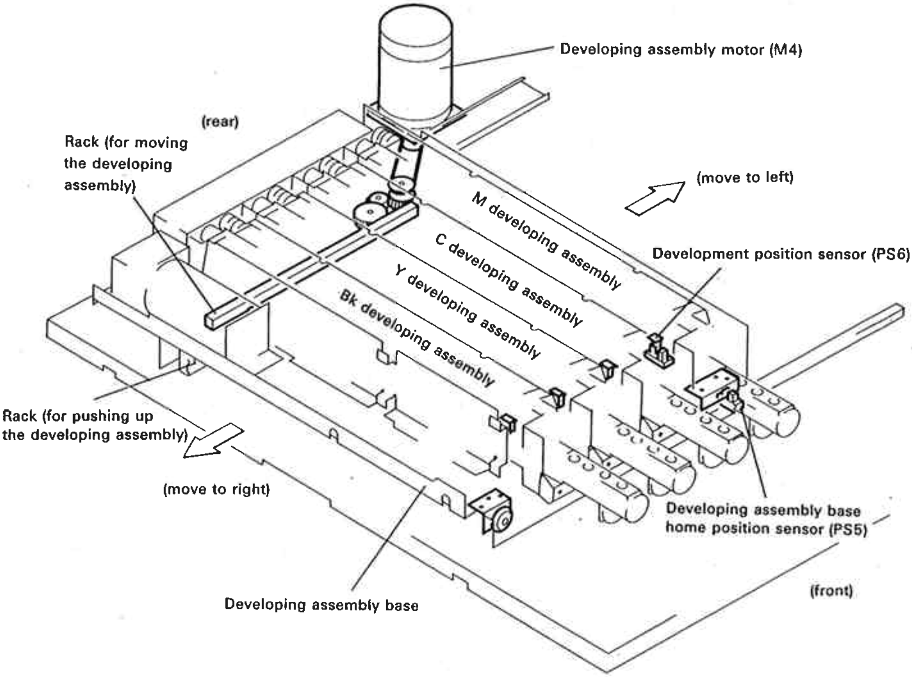

Developing assembly motor (M4)
(rear)
Rack (for moving the developing assembly)
(move to left)
M developing assembly
C developing assembly
Y developing assembly
Bk developing assembly
Development position sensor (PS6)
Rack (for pushing up the developing assembly)
(move to right)
Developing assembly base home position sensor (PS5)
(front)
Developing assembly base

Figure 3-528

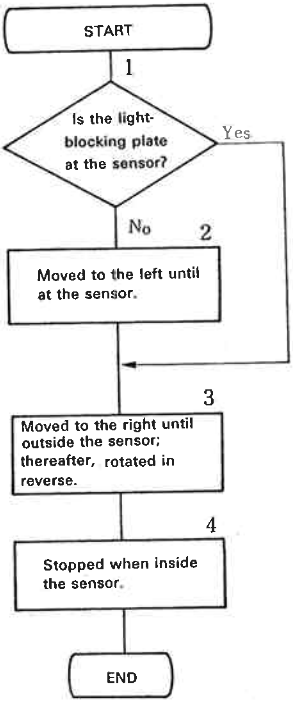
The development position sensor (PS6), further, is equipped with four light-blocking plates; PS6 is ON when the developing assembly base is at a point of development.

Should PS 6 fail to go ON after M4 is rotated over the distance to the point of development, 'E021' will be indicated.

c. Developing Assembly Base Home Position (HP) Search

The developing assembly base HP search is performed by the developing assembly HP sensor (PS5) located on the base plate of the machine and the light-blocking plates on the developing assembly base.

The developing assembly base HP search is performed in the following sequence:


START
1
Is the light-blocking plate at the sensor?
Yes
No
2
Moved to the left until at the sensor.
3
Moved to the right until outside the sensor; thereafter, rotated in reverse.
4
Stopped when inside the sensor.
END

The developing assembly HP search is performed under the following conditions:

- During initial rotation after the power is turned ON.
- Upon completion of DSRDY after the COPY START key is pressed.
- Upon completion of copy operation.
- Upon detection of a jam.
- Upon indication of an error code.

'E021' is indicated if the search is started with the light-blocking plate inside the HP sensor and is not over within five seconds or if the search is started with the light-blocking plate outside the HP sensor and is not over within ten seconds.

If the lower feeder unit is released with the developing assembly base on the right side when a jam occurs, it can interfere with the developing assembly. As such, when a jam occurs, the developing assembly base HP search is performed and, thereafter, the 'JAM' message is displayed.

d. Motor Circuitry

1) Outline

Figure 3-529 shows the circuit that controls the developing assembly motor.

The developing assembly motor rotates in two directions to move the developing assembly base to the right and left in parallel.

Its speed, further, varies to suit the distance and mode of movement.

2) Mechanism

The microprocessor (Q686) on the developing assembly motor driver PCB receives such instructions as on the destination of the developing assembly from the DC controller PCB. In response to a start command thereafter, it sends drive pulses to the developing assembly motor (M4) according to such instructions.

The developing assembly motor is a 5-phase stepping motor, and its direction and speed are controlled by changing the order of drive pulses (A through E) and frequency. The constant current control circuit, further, switches the current that flows to the motor over three steps as shown in Table 3-501 to prevent over-heating of the motor.

Operation	Current
During developing assembly movement	HIGH
During HP search, during development	MEDIUM
At standby	LOW

Table 3-501

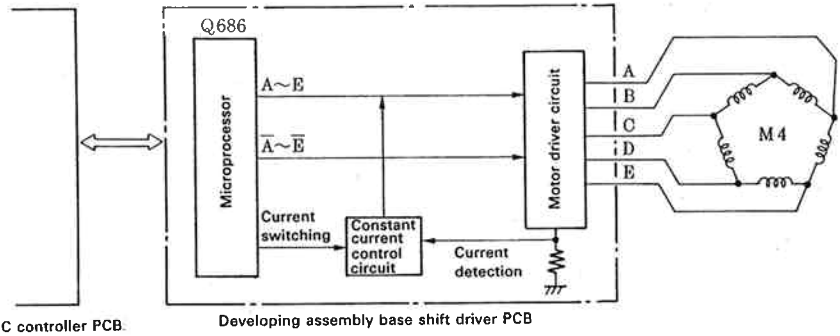

Q686
Microprocessor
A~E
$\overline{A}$~$\overline{E}$
Current switching
Constant current control circuit
Current detection
Motor driver circuit
A
B
C
D
E
M4
DC controller PCB
Developing assembly base shift driver PCB

Figure 3-529

e. Developing Assembly Engagement

The drive of the developing assembly motor (M4) moves the developing assembly base and is relayed to the developing assembly push-up clutch (CL5) attached to the base plate of the copying machine by way of the rack on the developing assembly base.

CL5 goes ON 20 mm* in front of the point of development to which the development assembly base moves; when it goes ON, the developing assembly engagement cam rotates to engage the developing assembly with the photosensitive drum.

> **Note:**
> When the developing assembly engagement cam starts to rotate at this timing, it stops at the point of engagement when the developing assembly base stops at the point of development.

CL5 remains ON during development to keep the developing assembly engagement cam still.

When the development is complete and the developing assembly mount is moved, the developing assembly engagement cam rotates to release the engagement; at the time, CL5 goes OFF when the developing engagement cam TOP sensor (PS1) goes OFF.

■ Developing assembly released

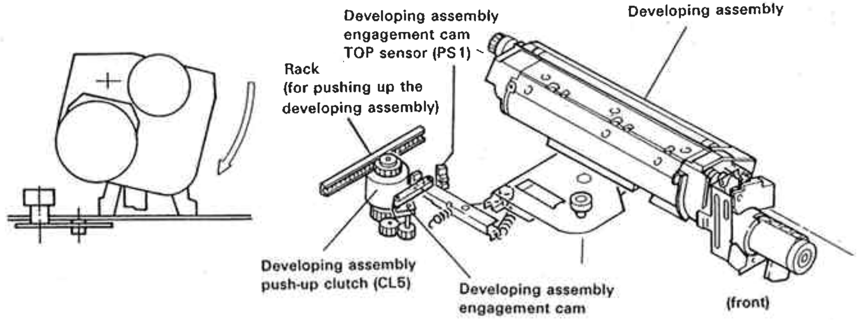

Developing assembly engagement cam TOP sensor (PS1)
Developing assembly
Rack (for pushing up the developing assembly)
Developing assembly push-up clutch (CL5)
Developing assembly engagement cam
(front)

Figure 3-530

■ Developing assembly engaged

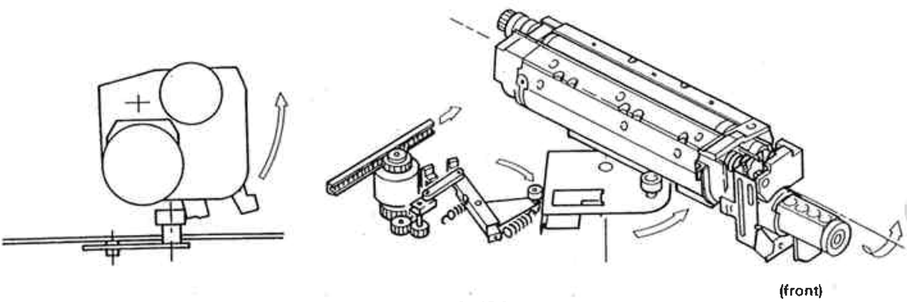
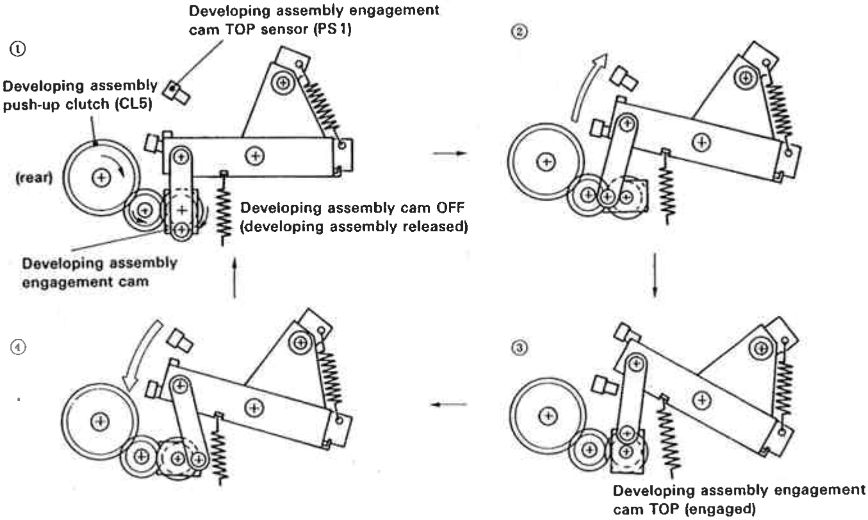


Figure 3-531

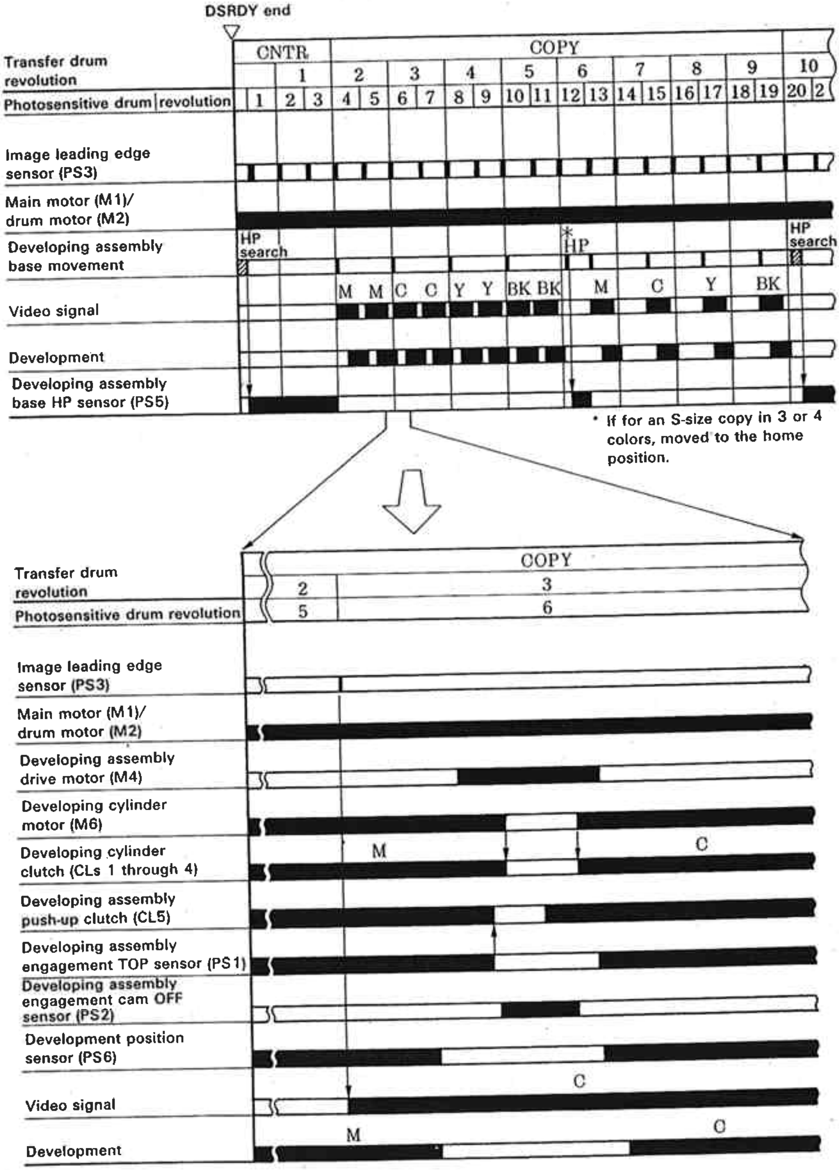
See Figure 3-532 for the operation* of the developing assembly engagement cam.


①
Developing assembly engagement cam TOP sensor (PS 1)
Developing assembly push-up clutch (CL5)
(rear)
Developing assembly cam OFF (developing assembly released)
Developing assembly engagement cam
②
③
④
Developing assembly engagement cam TOP (engaged)

- When the M developing assembly is engaged, the developing assembly base is moved to the left; as such, the movement will be the opposite of that illustrated.

Figure 3-532

3. Sequence of Operations (developing assembly movement and engagement)



* If for an S-size copy in 3 or 4 colors, moved to the home position.

Figure 3-533 A4/LTR, 3 Copies, 4-Color, Potential Control ON

4. Color Toner Concentration

a. Outline

Each of the M, C, and Y developing assemblies is equipped with a color toner concentration sensor to check the concentration of the toner for the developing assembly in operation.

Each sensor is of a photo detection type and detects the light (near infrared) reflected by the toner on the developing cylinder by its photodiode to determine the amount of toner to be supplied to make up for the difference from the initial concentration.

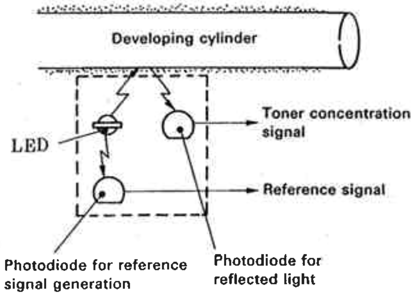

Developing cylinder
LED
Toner concentration signal
Reference signal
Photodiode for reference signal generation
Photodiode for reflected light

Figure 3-534

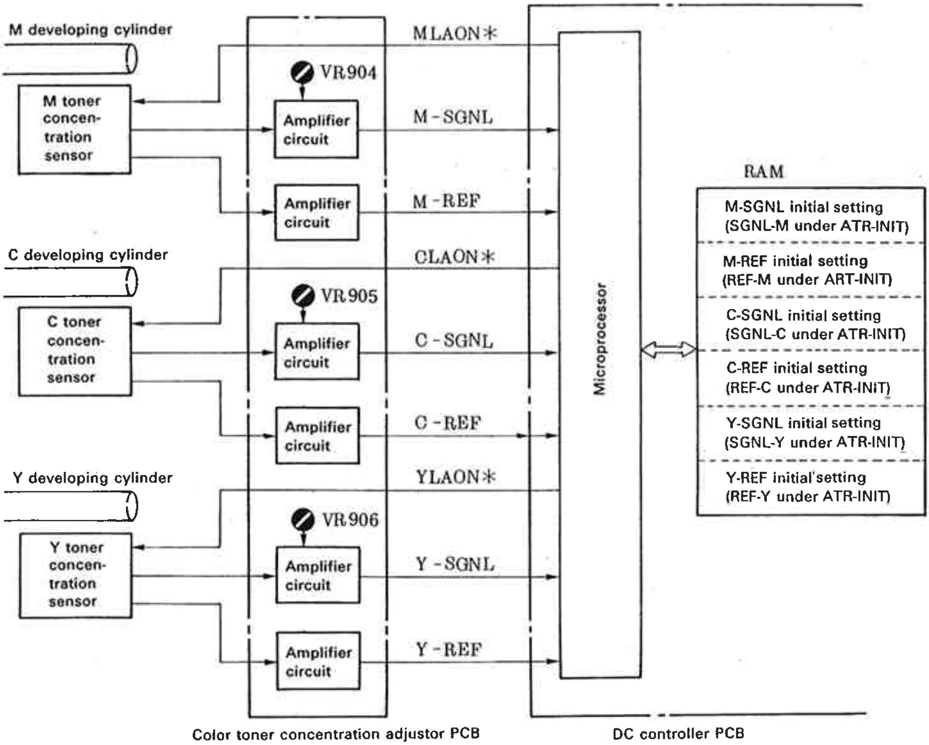

M developing cylinder
M toner concentration sensor
C developing cylinder
C toner concentration sensor
Y developing cylinder
Y toner concentration sensor
VR904
VR905
VR906
Amplifier circuit
MLAON*
M-SGNL
M-REF
CLAON*
C-SGNL
C-REF
YLAON*
Y-SGNL
Y-REF
Microprocessor
RAM
M-SGNL initial setting (SGNL-M under ATR-INIT)
M-REF initial setting (REF-M under ART-INIT)
C-SGNL initial setting (SGNL-C under ATR-INIT)
C-REF initial setting (REF-C under ATR-INIT)
Y-SGNL initial setting (SGNL-Y under ATR-INIT)
Y-REF initial setting (REF-Y under ATR-INIT)
Color toner concentration adjustor PCB
DC controller PCB

Figure 3-535

Note:
Paint and toner reflect near infrared light; the carrier (iron powder) of the developer, however, tends to absorb the light spectrum.

In other words, the level of near infrared reflected by the developer decreases as the level of toner in the developer decreases.

Each sensor, in addition to the photodiode which detects the concentration of the toner, is also equipped with a photodiode which generates reference signals used to detect deterioration of the LEDs.

b. VR Adjustment (ATR-VR)

Pour the starter developer, stir it in the service mode, and adjust VRs 904 through 906 so that each signal is within its specified value (204±3).

Table 3-502 is a list of signals that change in response to the adjustment of respective VRs.

Note:
Adjust all VRs 904 through 906 when the color toner concentration adjustor PCB or sensor (as part of the developing assembly or otherwise) has been replaced. For details, see the SERVICE HANDBOOK.

c. Setting the Initial Value (ART-INIT)

Stir the toner once again, and store the average of several signal readings taken into RAM as the initial value.

d. Checking the Concentration

The LED is caused to go ON when the developing assembly is engaged with the photosensitive drum and the developing cylinder is rotating. The microprocessor reads the toner concentration signal and reference signal and compares them against the initial setting stored in RAM to compute the degree of change in the concentration.

Based on this degree of change, an amount of toner is decided, and toner is supplied from the hopper.

See Table 3-502 for the signals, VRs, and the corresponding names in the service mode. The following may be executed in the service mode:

- ATR-VR .... VR adjustment
- ATR-INT .... RAM read-in
- DISPLAY 3 or DENS/VCONT ....checks during copying

Signal	VR	Adjustment value	Name in service mode
Y reference signal (Y-REF)	—	—	REF-Y
C reference signal (C-REF)	—	—	REF-C
M reference signal (M-REF)	—	—	REF-M
M toner concentration signal (M-SGNL)	904	204±3	SGNL-M
C toner concentration signal (C-SGNL)	905	204±3	SGNL-C
Y toner concentration signal (Y-SGNL)	906	204±3	SGNL-Y

Table 3-502

5. Black Toner Concentration (CLC200)

a. Outline

The black toner concentration sensor is found inside the photosensitive drum unit and is used to detect the concentration of the black toner image developed on the non-image area of the photosensitive drum.

The sensor, like the color toner concentration sensor, is of a photo detection type, and detects the light reflected by the toner on the drum by its photodiode to determine the amount of toner to be supplied based on the difference from the initial setting.

As in the case of the color toner concentration sensor, it also detects deterioration of the LED based on the reference signal.

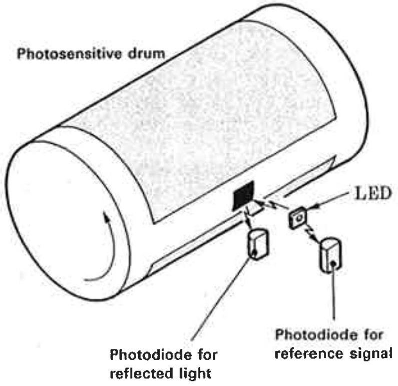

Photosensitive drum
LED
Photodiode for reference signal
Photodiode for reflected light

Figure 3-536

Note:
The black toner differs from the Y, M, and C toners in that it absorbs near infrared light; as such, the concentration of toner in the developer cannot be checked in the same manner as with the other toners.

Since the photosensitive drum reflects near infrared light, however, the concentration of the black toner can be detected by exposing the black toner image on the drum with near infrared light. In other words, a lighter black toner image, reflecting more light, represents a decrease in the level of toner in the developer.

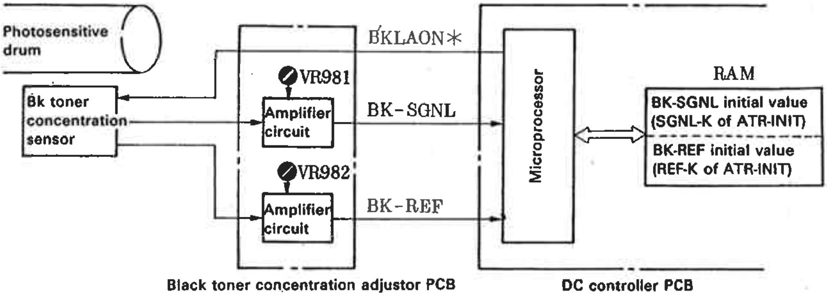

Photosensitive drum
Bk toner concentration sensor
BKLAON*
VR981
Amplifier circuit
BK-SGNL
VR982
Amplifier circuit
BK-REF
Microprocessor
RAM
BK-SGNL initial value (SGNL-K of ATR-INIT)
BK-REF initial value (REF-K of ATR-INIT)
Black toner concentration adjustor PCB
DC controller PCB

Figure 3-537

b. VR Adjustment (SGNL-K and REF-K of ATR-VR)

Put the Bk starter toner, and use the service mode to stir it. When SGNL-K is ON under ATR-VR, the LED goes ON without toner on the photosensitive drum. In this condition, turn VR981 so that the output of the sensor (BK-SGNL) is within the specified value (128±3).

VR982 need not be adjusted; use it if the value is not 204 ±3 when replacing the starter toner.

c. Setting the Target Value (INIT=K of ATR-INIT)

Store the initial values of SGNL-K and REF-K used to control the concentration of the toner inside the black developing assembly into RAM using ATR-INIT.

See Table 3-504 for the signals, VRs, and the corresponding names in the service mode. The following may be executed in the service mode:

- ATR-VR .... VR adjustment
- ATR-INIT .... RAM read-in
- DENS/CONT .... checks during copying

Signal	VR	Setting	Name in service mode
BK-SGNL	981	204±3	SGNK-K
BK-REF	982	204±3	REF-K

Table 3-503

d. Detection of Concentration

When the black developing assembly is engaged with the photosensitive drum, the laser goes ON, and the black toner image is placed on the photosensitive drum.

The LED is caused to go ON immediately before the black toner image moves past the sensor, and the black toner concentration signal and reference signal are read while it moves past the sensor.

These signals are compared against the initial setting stored in RAM to compute the change in the concentration.

The amount of toner to be supplied is determined based on the change, and toner is supplied from the hopper.

Note:
The black toner placed on the photosensitive drum for detection of toner concentration needs to be kept away from the transfer sheet. For this, the laser is caused to go ON at the right timing so that the black toner comes opposite the metal plate of the transfer sheet when it has rotated to the point of transfer.

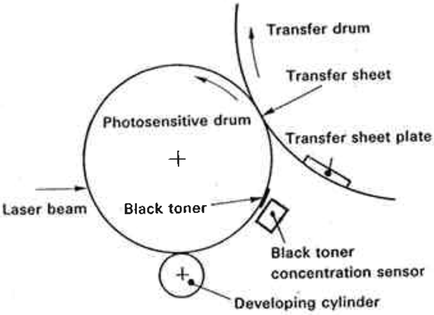


Figure 3-538

6. Measurement of Drum Toner Concentration (CLC300/350)

a. Outline

The black toner concentration sensor is found inside the photosensitive drum unit and serves to measure the concentration of toner images of each color (MCYBk).

Like the color toner concentration sensor inside each developing assembly used by each color (CMY), the black toner concentration sensor is of a photoelectric type, which checks the light reflected by the toner on the drum using a diode.

To obtain accurate measurements of the concentration of the toner on the drum, correction for LED deterioration and soiling on the sensor window is also executed.

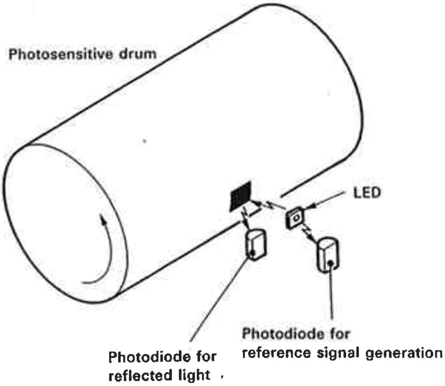

Photosensitive drum
LED
Photodiode for reference signal generation
Photodiode for reflected light

Figure 3-539

Note:
Each toner (MCY) reflects the near infrared light emitted by a LED; black toner, on the other hand, absorbs light in this spectrum. The density of the M, C, Y, and Bk toners on the drum is measured using the relationship 'Bk toner < photosensitive drum < MCY toner'.

b. VR Adjustment (SGNL-K and REF-K of ATR-VR)

Put the Bk starter toner, and use the service mode to stir it. When SGNL-K is ON under ATR-VR, the LED goes ON without toner on the photosensitive drum. In this condition, turn VR981 so that the output of the sensor (BK-SGNL) is within the specified value (128±3).

VR982 need not be adjusted; use it if the value is not 204 ±3 when replacing the starter toner.

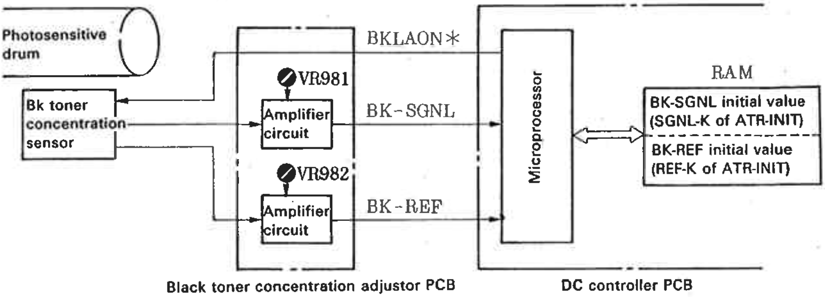

Photosensitive drum
Bk toner concentration sensor
VR981
Amplifier circuit
VR982
Amplifier circuit
BKLAON*
BK-SGNL
BK-REF
Microprocessor
RAM
BK-SGNL initial value (SGNL-K of ATR-INIT)
BK-REF initial value (REF-K of ATR-INIT)
Black toner concentration adjustor PCB
DC controller PCB

Figure 3-540

c. Setting the Target Value (INIT=K of ATR-INIT)

Store the initial values of SGNL-K and REF-K used to control the concentration of the toner inside the black developing assembly into RAM using ATR-INIT.

See Table 3-504 for the signals, VRs, and the corresponding names in the service mode. The following may be executed in the service mode:

- ATR-VR .... VR adjustment
- ATR-INIT .... RAM read-in
- DENS/CONT .... checks during copying

> **Note:**
> In the service mode, SGNL-MCY and REF-K of ATR-VR are adjusted so that the setting will be 204±3; SGNL-K, on the other hand, must be adjusted so that the setting will be 128±3. This is to execute measurement of the concentration of toner on the drum not only for black but also for magenta, cyan, and yellow; see p.3-66.

Signal	VR	Setting	Name in service mode
BK-SGNL	981	128±3	SGNK-K
BK-REF	982	204±3	REF-K

Table 3-504

d. Monitoring the Soiling of the Window

As the beginning of SALT control and during control rotation (CNTR) after the COPY START key is pressed, a LED is turned ON to measure BK-SGNL without toner on the drum; the value of BK-SGNL will be low if the window of the sensor is soiled. The difference between the BK-SGNL value and the specified value '128' is stored as the correction value and used to correct the output of the sensor during the following:

i. Correction of target contrast potential
ii. Correction of gradation
iii. Control of concentration of toner inside black developing assembly

If, during the above, the measurement (BK-SGNL) is 60% or less of the specified value '128', 'E020' will be indicated on the display; if 80% or more, a and b above will not be executed and 'ERR = X1XXXXX' will be indicated for SALT. If such is the case, follow the instructions on p. 3-65.

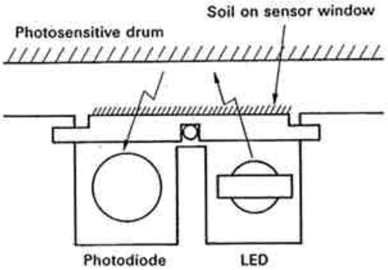


Figure 3-541

e. Toner Density Control (black developing assembly)

When the black developing assembly is engaged with the photosensitive drum, the laser goes ON, and the black toner image is placed on the photosensitive drum.

The LED is caused to go ON immediately before the black toner image moves past the sensor, and the black toner concentration signal and reference signal are read while it moves past the sensor.

These signals are compared against the correction value for soiling and initial value stored in RAM to compute the change in the concentration.

The amount of toner to be supplied is determined based on the change, and toner is supplied from the hopper.

Note:
The black toner placed on the photosensitive drum for detection of its concentration during copying operation needs to be kept away from the transfer sheet. For this, the laser is caused to go ON at the right timing so that the black toner comes opposite the metal plate of the transfer sheet when it has rotated to the point of transfer.

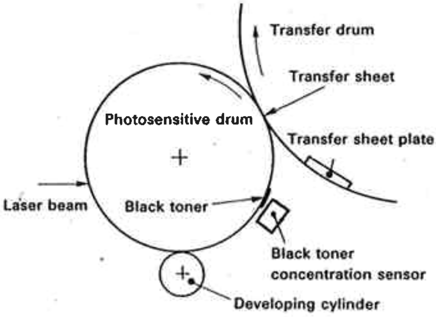

Transfer drum
Transfer sheet
Photosensitive drum
Transfer sheet plate
Laser beam
Black toner
Black toner concentration sensor
Developing cylinder

Figure 3-542

7. Toner Supply

The machine is equipped with four hoppers; each for M, C, Y, and Bk. See Figure 3-543 for the construction of the M hopper.

When the concentration of toner in any of the developing assemblies drops below a specified value, the toner supply clutch for that developing assembly goes ON.

When the toner supply clutch goes ON, the drive of the main motor (M1) is transmitted to the screw to forward toner to the developing assembly.

The developing assembly is supplied with toner when it is at the point of development.

The clutch remains ON for a period of time corresponding to the amount of toner to be supplied as determined by the toner concentration detection PCB.

Each hopper is equipped with a toner sensor made of a piezoelectric oscillator; when the amount of toner falls below a specified value, the 'ADD TONER' message is indicated on the control panel upon completion of the copy run.

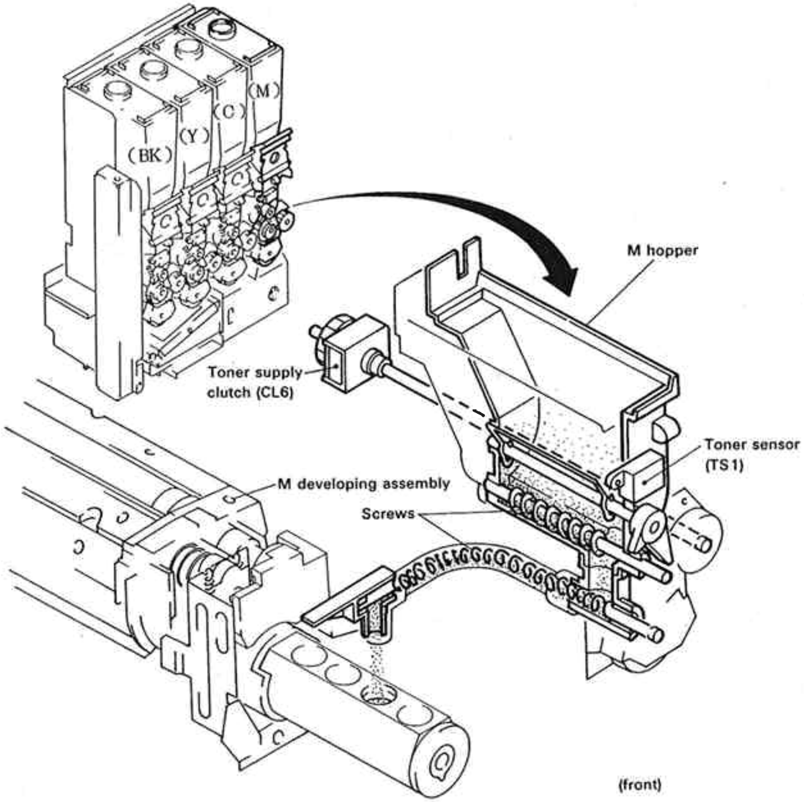


Figure 3-543

Table 3-505 shows combinations of toner supply clutches and toner sensors.

	M	C	Y	Bk
Toner supply clutch	CL6	CL7	CL8	CL9
Toner sensor	TS1	TS2	TS3	TS4

Table 3-505

Note:
The detector section of the toner sensor used inside the hopper consists of a piezoeletric oscillator; in the absence of toner, it oscillates at several kHz and its output goes '0'. In the presence of toner, on the other hand, the weight of the toner keeps the oscillator still and, as a result, the output of the sensor goes '1'.

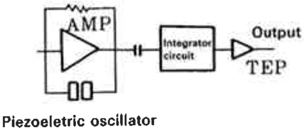


Figure 3-544

8. Photosensitive Drum Cleaning

The photosensitive drum cleaner is driven by the main motor (M1), and the waste toner scraped off by the cleaning blade is forwarded to the waste toner receptacle for collection.

The level of waste toner is detected by the waste toner sensor of a filtration type; when the level rises above its specified value, the 'WASTE TONER FULL' message is indicated on the control panel upon completion of the copy run.

The pedestal has a large-capacity waste toner receptacle and, as such, the user need not empty the receptacle.

It is important, however, to de-activate the waste toner level detection mechanism when a large-capacity waste toner receptacle is used; see CHAPTER 5.

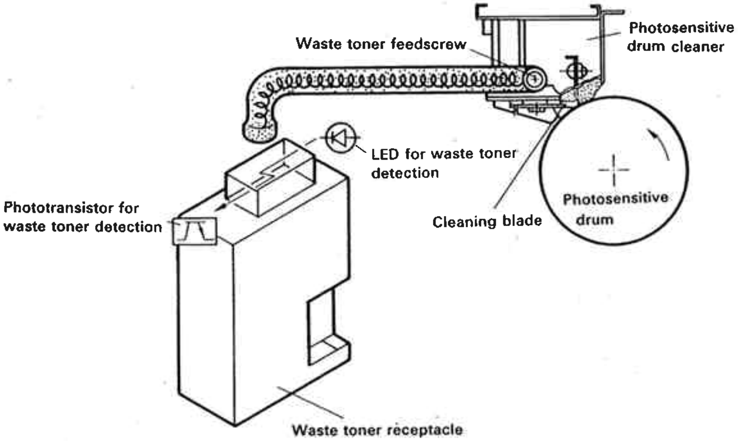

Waste toner feedscrew
Photosensitive drum cleaner
LED for waste toner detection
Phototransistor for waste toner detection
Cleaning blade
Photosensitive drum
Waste toner receptacle

Figure 3-545

VI. PICK-UP AND FEEDER SYSTEM

A. Outline

When the pick-up roller rotates, a single sheet of copy paper is picked up and fed into the machine.

The paper is forwarded to the registration roller by the feeder roller.

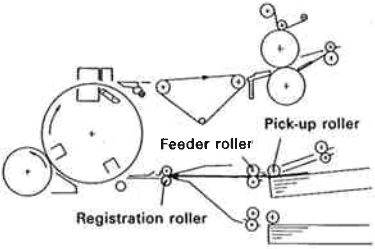
After the registration roller starts to rotate, the attraction roller is engaged and the attraction corona unit goes ON to wind the paper around the transfer drum statically.

The toner image on the photosensitive drum is transferred to the paper in this condition; in other words, the paper is rotated a maximum of four times while retained on the transfer drum.

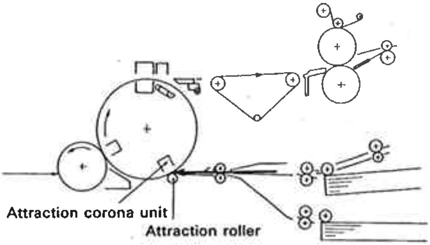
In making S-size copies (182 to 216 mm) in 4-, 3-, or 1-color, two sheets are attached to the transfer drum at the same time so as to speed up the copy operation.

Upon completion of transfer, the paper is detached from the transfer drum by the work of the separation corona unit and separation claw.

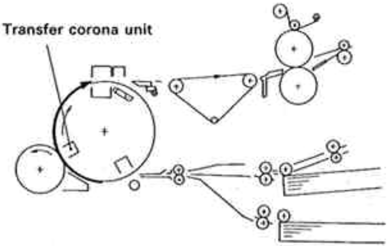
The paper so detached is sent to the fixing assembly by the feeder belt and delivered to the copy tray.


Pick-up roller
Feeder roller
Registration roller

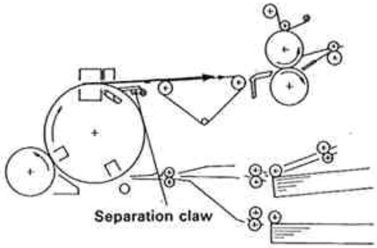
① Pick-up


Attraction corona unit
Attraction roller

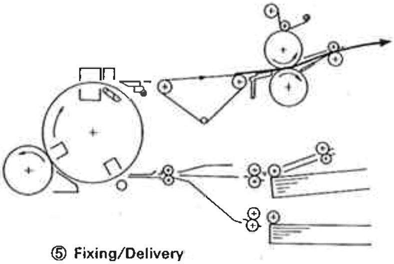
② Static attraction


Transfer corona unit

③ Transfer


Separation claw

④ Separation



⑤ Fixing/Delivery

B. Pick-up

1. Cassette

a. Outline

The cassettes for the CLC200/300/350 are of a center-standard, clawless type; the machine provides two cassette holders for L- and S-size cassettes.

Each of the cassette holders may be modified to accommodate different cassette sizes through replacing the guide plate and detection plate by the serviceman.

S-size papers

- A4
- B5
- A4-R
- B5-R
- LTR
- LTR-R
- ARG. LTR
- G
- K
- STMT
- ARG. LTR-R
- G-R
- K-R

STMT is outside spec for the CLC200/300/350 and cannot be used.

L-size papers

- A3
- B4
- 11"×17"
- LGL
- ARG. LGL
- FLS
- OFC
- FOLIO
- AUS. FLS
- G. LGL
- BLV
- E. ARG. OFC

See p. 5-32 for how to replace the guide plate and detection plate.

b. Detection of Cassette Size

The cassette holders are equipped with switches which are actuated when a cassette is set.

Since these switches are located in such an arrangement, the microprocessor can recognize the presence and size of the cassette based on the combination of actuated switches; see Table 3-600.

Arrangement Cassette	SW (front)	SW	SW	SW (rear)
No cassette.	0	0	0	0
B5 (182×257)	0	0	0	1
Reserved.	0	0	1	0
A4 (210×297)	0	0	1	1
B5R (257×182)	0	1	0	0
B4 (364×257)	0	1	0	1
A4R (297×210)	0	1	1	0
A3 (420×297)	0	1	1	1
* U–S (190~279×190~279)	1	0	0	0
Reserved.	1	0	0	1
* U–L (203~220×317~354)	1	0	1	0
Letter 8.5"×11" (216×279)	1	0	1	1
** STMT 5.5"×8.5" (216×140)	1	1	0	0
Legal 8.5"×14" (356×216)	1	1	0	1
Letter R 8.5"×11" (279×216)	1	1	1	0
Ledger 11"×17" (432×279)	1	1	1	1

(unit: mm)

Table 3-600

0: SW is OFF.
1: SW is ON.

* Sizes may be stored in memory within values give; for details, see the service mode.

** STMT is outside of spec for the CLC 200/300/350 and cannot be used.

2. Pick-Up from Cassette

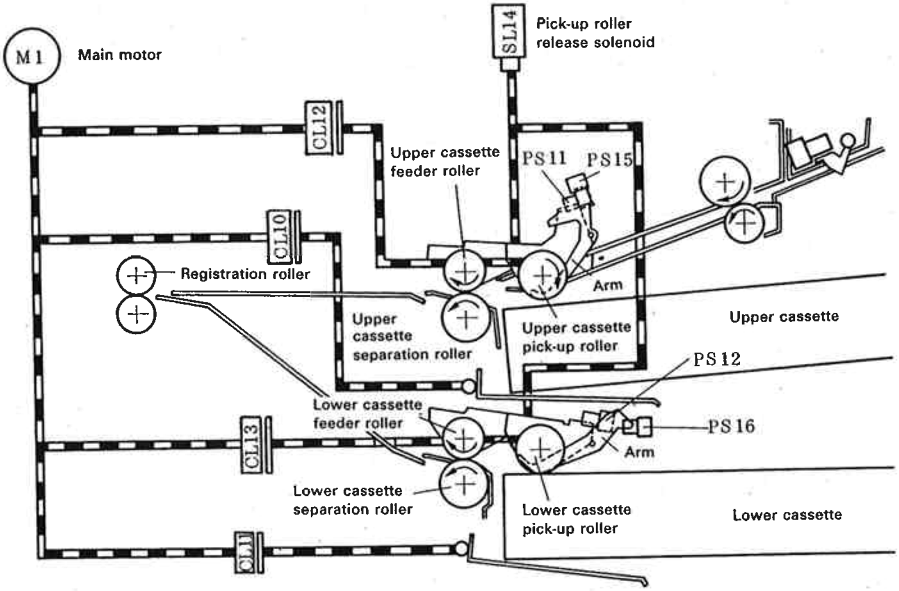
The pick-up unit is constructed as shown in Figure 3-600.

All following loads are driven by the main motor (M1) by way of clutches.

- Upper/lower cassette pick-up roller
- Upper/lower cassette feeder roller
- Upper/lower cassette separation roller

When the COPY START key is pressed and the document exposure system is ready, the lifter clutch (CL10/CL11) goes ON if the lifter limit sensor (PS11/PS12) identifies the absence of paper inside the cassette; the condition then causes the lifter to rise until the lifter limit sensor detects the lifter.

At the time, the paper sensor (PS15/PS16) checks the presence of paper inside the cassettes.


M1
Main motor
SL14
Pick-up roller release solenoid
CL12
CL10
CL13
CL11
Registration roller
Upper cassette feeder roller
PS11
PS15
Arm
Upper cassette separation roller
Upper cassette pick-up roller
Upper cassette
PS12
Lower cassette feeder roller
PS16
Arm
Lower cassette separation roller
Lower cassette pick-up roller
Lower cassette

CL10: Upper cassette lifter clutch
CL11: Lower cassette lifter clutch
CL12: Upper cassette pick-up clutch
CL13: Lower cassette pick-up clutch

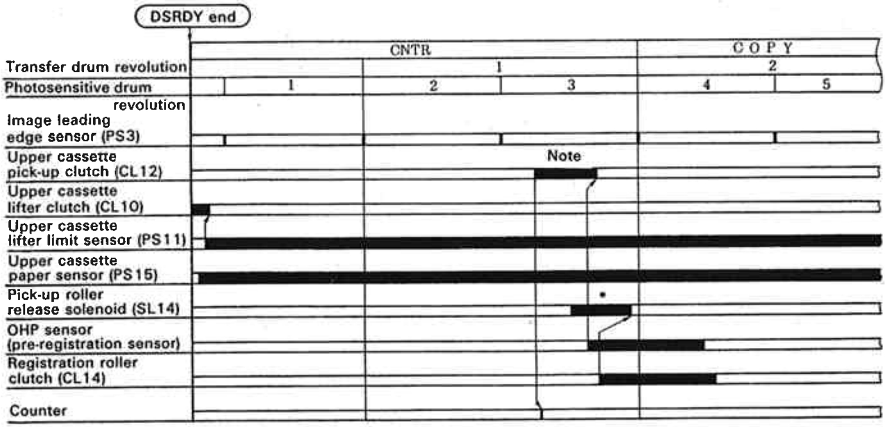
PS11: Upper cassette lifter limit sensor
PS12: Lower cassette lifter limit sensor
PS15: Upper cassette paper sensor
PS16: Lower cassette paper sensor

Figure 3-600

If the paper sensor does not detect the presence of paper, the DC controller judges the condition to be the absence of paper and indicates the 'ADD PAPER' message on the control panel.

If paper is inside the cassette, the pick-up clutch (CL12/CL13) goes ON to pick up a sheet of paper. The pick-up roller release solenoid (SL14) goes ON after the pick-up clutch goes ON to lift the pick-up roller unit from the stack of copy paper. The paper so picked up is then fed into the machine and onto the registration roller unit.

When the stack of paper in the cassette lowers in height and, as a result, the lifter limit sensor goes '0', the lifter clutch goes ON and the lifter rises; the lifter clutch goes OFF 0.05 seconds after the lifter position is detected.


DSRDY end
CNTR
COPY
Transfer drum revolution
1
2
Photosensitive drum revolution
1
2
3
4
5
Image leading edge sensor (PS3)
Upper cassette pick-up clutch (CL12)
Note
Upper cassette lifter clutch (CL10)
Upper cassette lifter limit sensor (PS11)
Upper cassette paper sensor (PS15)
Pick-up roller release solenoid (SL14)
*
OHP sensor (pre-registration sensor)
Registration roller clutch (CL14)
Counter

* Varies according to copy size.

Note:
When small-size copies (A4/LTR) are made without potential control, the pick-up takes place earlier by an equivalent of a single rotation of the photosensitive drum; in this case, the first copy is retained on side B of the transfer drum ; CLC200/300 only.

Figure 3-601 Pick-Up from Upper Cassette, A4/LTR, Full-Color, DIRECT, Potential Control ON

3. Pick-Up from Manual Feed Tray

The manual feed pick-up unit is constructed as shown in Figure 3-602.

The manual feed pick-up roller is driven by the main motor (M1) by way of the upper cassette pick-up clutch (CL12).

When the manual feed lever is shifted down, the upper cassette pick-up roller and manual feed stopper are lifted.

At the same time, the manual feed mode sensor (PS14) detects the lever, and the manual feed pick-up mode signal (MFS) is sent to the DC controller to switch over to the manual feed mode.

The pre-pick-up operation, in which paper is forwarded up to the upper cassette paper sensor (PS15), is performed only when the following conditions are met after paper is inserted along the tray.

- The manual feed mode sensor (PS14) has detected the lever.
- The manual feed paper sensor (PS13) has detected copy paper.
- The preceding paper (fed manually) has been delivered.

Thereafter, when the COPY START key is pressed and the document exposure system is ready, the paper is fed to the registration unit as in the case of a pick-up from the cassette.

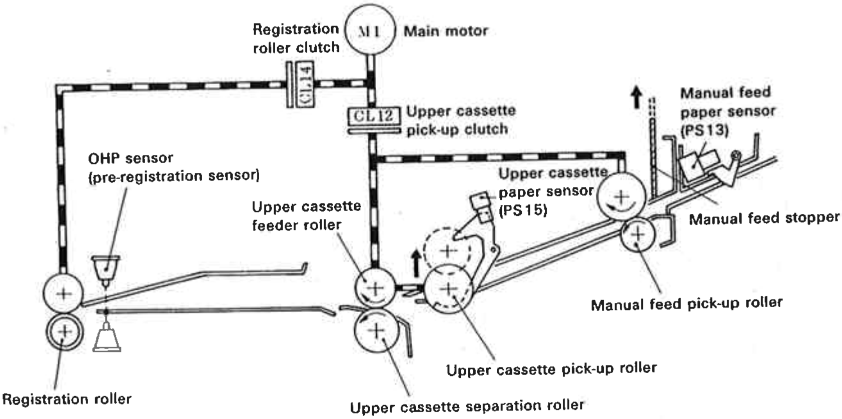

Registration roller clutch
M1
Main motor
CL14
CL12
Upper cassette pick-up clutch
Manual feed paper sensor (PS13)
OHP sensor (pre-registration sensor)
Upper cassette paper sensor (PS15)
Upper cassette feeder roller
Manual feed stopper
Manual feed pick-up roller
Upper cassette pick-up roller
Registration roller
Upper cassette separation roller

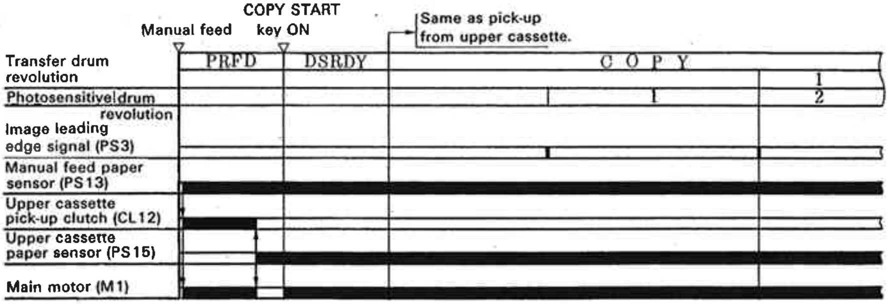
Figure 3-602

In the manual feed mode, the paper needs to be 182 mm or more lengthwise; paper smaller than that will defeat the machine as if pulled out in the middle, causing an error message to appear.

The length of the paper in the manual feed mode is checked by the manual feed paper sensor (PS13).

The OHP sensor (pre-registration sensor) checks if the paper is OHP film or otherwise to switch the feeding and fixing speeds; see p. 3-118.

Note:
OHP sheets used for the CLC200/300/350 (film) are provided with a 1-cm wide light-blocking strip at the leading edge. If the OHP sensor (pre-registration sensor) goes OFF, ON, and OFF at a specified timing during pick-ups, the machine identifies the paper to be an OHP sheet.



PRFD: Pre pick-up.

Figure 3-603 Manual Feed, A4/LTR, Full-Color, DIRECT, Potential Control ON

4. Pick-Up from Paper Deck

a. Outline

Pick-ups from the paper deck is by way of the lower cassette holder of the copying machine. For this reason, copying machines with a paper deck do not allow the use of its lower cassette holder.

b. Pick-Up Mechanism

The paper deck uses the pick-up roller, feeder roller, and separation roller of the lower cassette holder of the copying machine. As such, the pick-up operation of the paper deck is the same as that of the lower cassette holder of the copying machine; see p. 3-96.

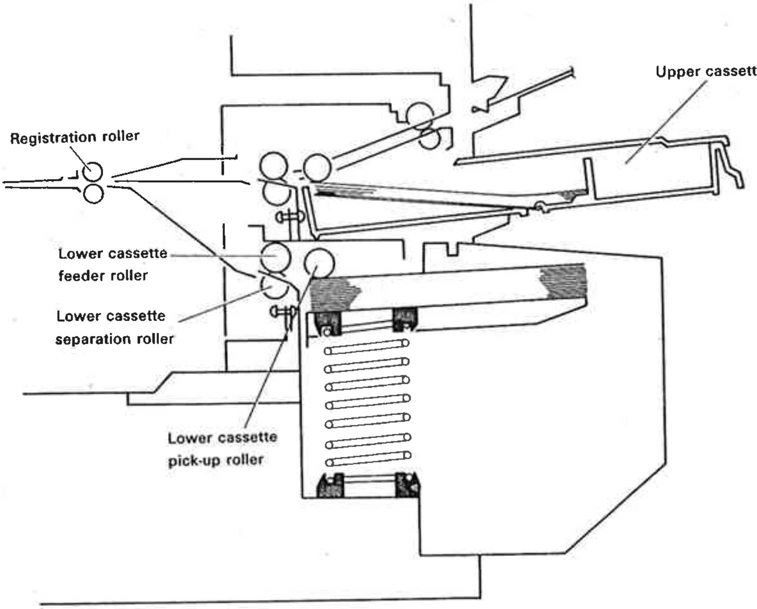

Upper cassette
Registration roller
Lower cassette feeder roller
Lower cassette separation roller
Lower cassette pick-up roller

Figure 3-603a

c. Lifter Mechanism

The lifter is raised to a given height by the work of a spring; thereafter, if the lower cassette lifter limit sensor (PS12) identifies the absence of paper at the pick-up point, the lower cassette lifter clutch (CL11) goes ON to move the lifter further up; the lifter is stopped when PS12 detects the lifter.

At the time, the lower cassette paper sensor (PS16) checks the presence/absence of paper inside the paper deck.

If the paper deck holds no paper inside, the arm falls into the hole of the lifter; the condition causes PS16 to identify the absence of paper, and the 'ADD PAPER' message will be indicated on the control panel.

If the cover of the paper deck is opened, the drive gear which is used to raise the lifter is released to stop the lifter from moving up.

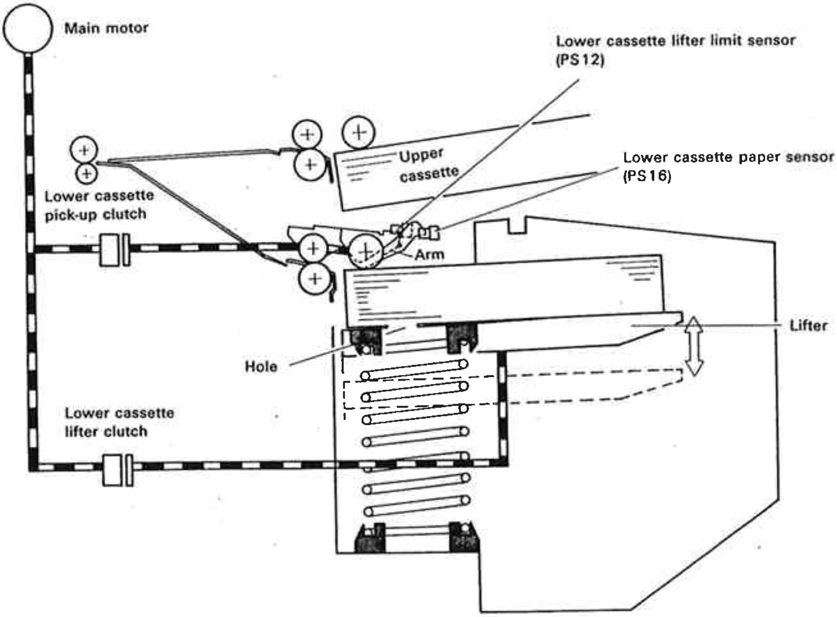

Main motor
Lower cassette lifter limit sensor (PS12)
Upper cassette
Lower cassette paper sensor (PS16)
Lower cassette pick-up clutch
Arm
Lifter
Hole
Lower cassette lifter clutch

Figure 3-603b

C. Transfer Drum

1. Outline

The transfer drum is constructed as shown in Figure 3-604.

The transfer drum serves to keep the copy paper by the work of static electricity and forward it to the fixing assembly after a maximum of four transfer operations.

The transfer drum and photosensitive drum are driven by the drum motor (M2).

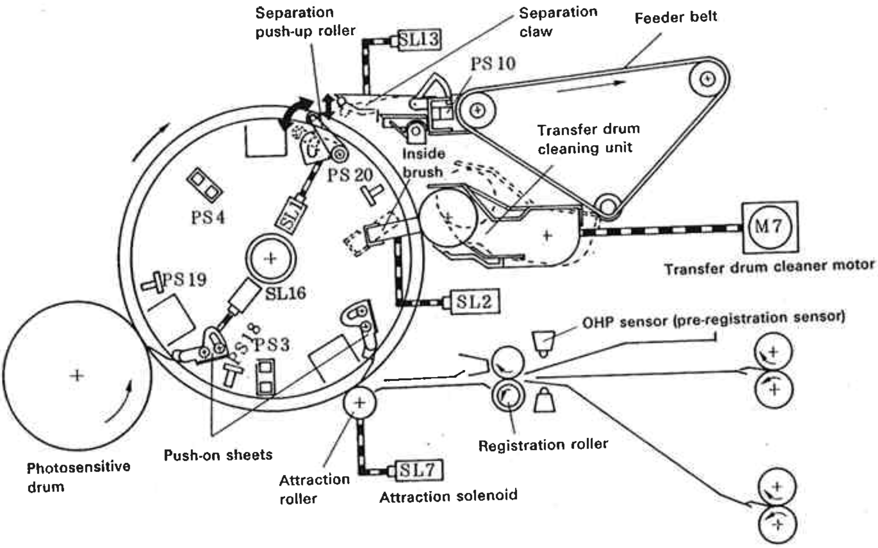
The feeder belt and registration roller are driven by the main motor (M1).

The transfer drum cleaning unit is driven by the transfer drum cleaner motor (M7).

The loads driven by solenoids are as follows:

- Attraction roller
- Separation push-up roller
- Separation claw
- Inside brush
- Transfer push-on sheet

The push-on sheets serve to keep the transfer drum in contact with the attraction roller and photosensitive drum.


Separation push-up roller
SL13
Separation claw
Feeder belt
PS 10
Transfer drum cleaning unit
Inside brush
PS 20
SL1
PS4
PS19
SL16
PS18
PS3
M7
Transfer drum cleaner motor
SL2
OHP sensor (pre-registration sensor)
Registration roller
Photosensitive drum
Push-on sheets
Attraction roller
SL7
Attraction solenoid

SL1: Separation push-up solenoid
SL2: Inside brush release solenoid
SL7: Attraction solenoid
SL13: Separation claw solenoid
SL16: Transfer push-on sheet release solenoid (CLC350 only)

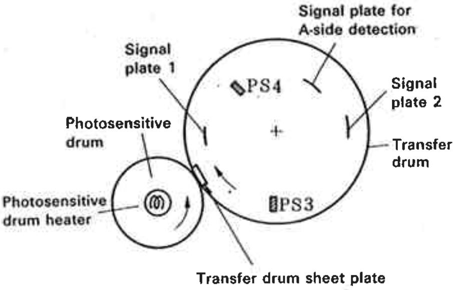
PS3: Image leading edge sensor
PS4: A-side sensor
PS10: Separation sensor
PS18: Attraction jam sensor
PS19: Transfer jam sensor
PS20: Transfer drum pre-cleaning sensor

Figure 3-604

2. Transfer Drum Rotation Control

When a copy run is over, the transfer drum stops at a point at which the transfer drum sheet plate comes into contact with the photosensitive drum to prevent deformation of the transfer drum sheet by the photosensitive drum heater.

The position is referred to as the home position of the transfer drum.


Signal plate for A-side detection
Signal plate 1
PS4
Signal plate 2
Photosensitive drum
Transfer drum
Photosensitive drum heater
PS3
Transfer drum sheet plate

PS3: Image leading edge sensor
PS4: A-side sensor

Figure 3-605

When the document exposure system is ready, the transfer drum starts to rotate.

The CLC200/300/350's copying operations are controlled based on the image leading edge signal (ILEG) generated by PS3 and signal plate 1/2.

3. Attraction Roller

The transfer drum of the CLC200/300/350 does not have a gripper; paper, instead, is kept on the drum by the work of static electricity.

The attraction solenoid (SL7) remains ON for a period of time equivalent to the length of the paper to keep the attraction roller in contact with the transfer drum sheet. At the time, the attraction corona unit goes ON, and the paper is retained on the transfer drum sheet statically.

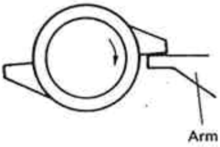


Figure 3-606 Control Cam (cross section of rear view)

Note:

i. If mono-color, the copy paper is separated before a full rotation is made; SL7, therefore, does not go OFF during the copy run but remains ON.

ii. When two sheets are retained, SL7 does not go OFF between the first and second sheets.

iii. SL7 goes ON after the end of LSTR or at the end of INTR at time of power-on to cause the attraction roller to move to the point of engagement. As such, the attraction roller is found at the point of engagement during STBY and when the power switch is OFF, thereby preventing deformation of the transfer sheet by the attraction push-on sheet.

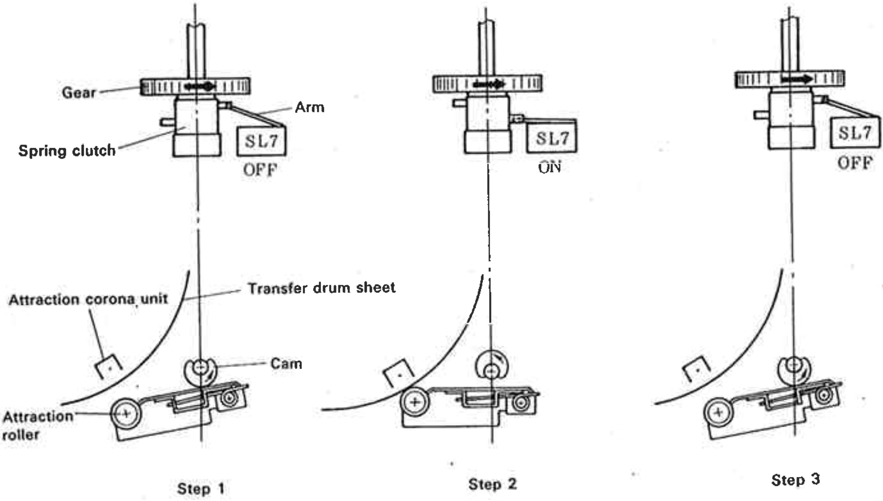

Gear
Arm
Spring clutch
SL7
OFF
Attraction corona unit
Transfer drum sheet
Cam
Attraction roller
Step 1
SL7
ON
Step 2
SL7
OFF
Step 3

Figure 3-607

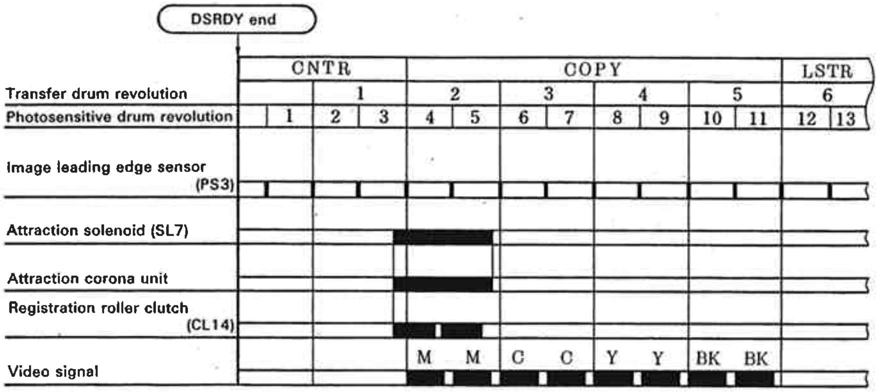

DSRDY end
CNTR
COPY
LSTR
Transfer drum revolution
1
2
3
4
5
6
Photosensitive drum revolution
1
2
3
4
5
6
7
8
9
10
11
12
13
Image leading edge sensor (PS3)
Attraction solenoid (SL7)
Attraction corona unit
Registration roller clutch (CL14)
Video signal
M
M
C
C
Y
Y
BK
BK

Figure 3-608 A4/LTR, 2 Copies, 4-Color, DIRECT, Potential Control ON

4. Releasing the Transfer Push-On Sheet (CLC350 only)

The CLC350 is capable of making two-sided copies, and for this reason fixing oil could stick to the transfer drum sheet. In addition, if the transfer push-on sheet forces the transfer sheet against the photosensitive drum while no copy paper is found in the transfer assembly, the oil can stick to the photosensitive drum, causing cleaning faults.

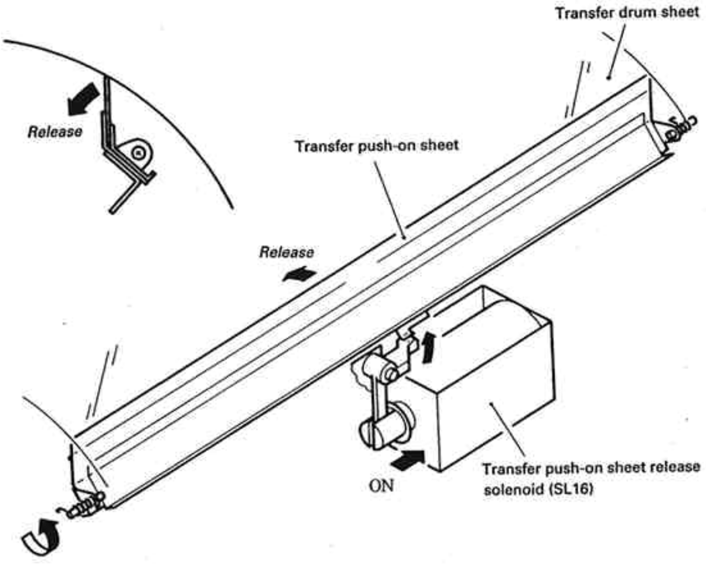

Transfer drum sheet
Release
Transfer push-on sheet
Release
ON
Transfer push-on sheet release solenoid (SL16)

Figure 3-609

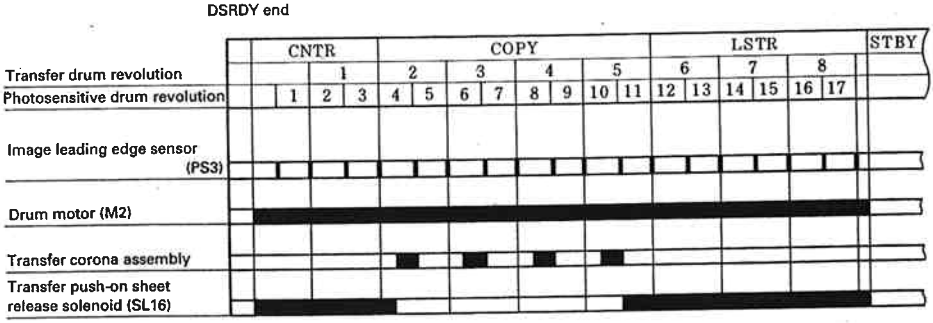


Figure 3-610 A4/LTR, 1 Copy, 4 Colors

5. Separation Control (CLC200)

Separation of CLC200 takes two different operations depending on the location of the copy paper on the transfer drum.

- A-side separation, for which paper is on its A-side.
- B-side (C-side) separation, for which paper is on its B-side.

a. A-Side Separation

As shown in Figure 3-611, separation in which copy paper is retained with its leading edge over the transfer drum sheet plate is referred to as A-side separation.

The separation is by the work of the separation claws; for details, see Table 3-601.

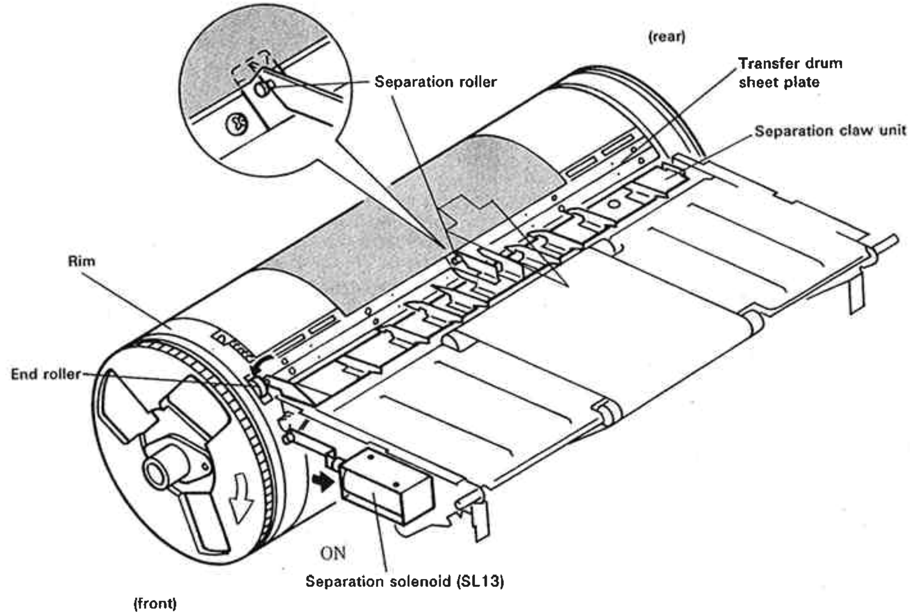

(rear)
Separation roller
Transfer drum sheet plate
Separation claw unit
Rim
End roller
ON
Separation solenoid (SL13)
(front)

Figure 3-611 CLC200 A-Side Separation

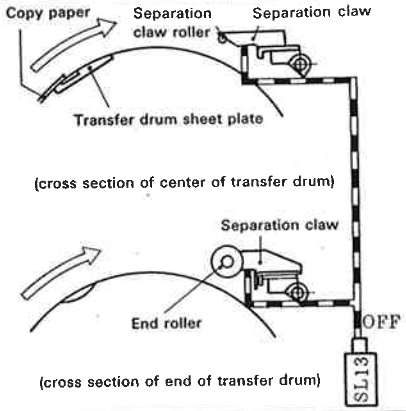
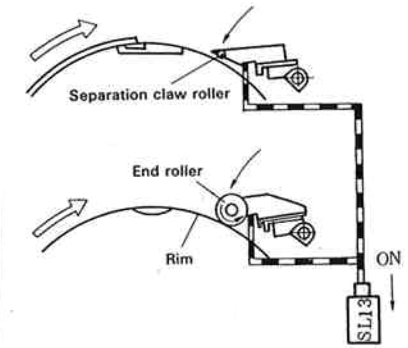
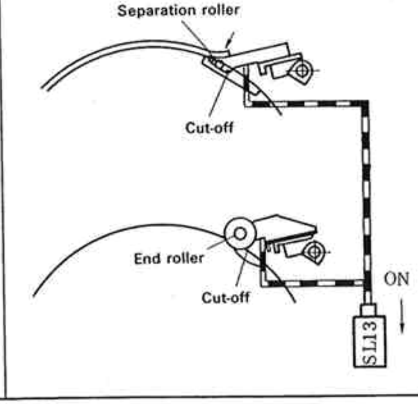
1	 Copy paper Separation claw roller Separation claw Transfer drum sheet plate (cross section of center of transfer drum) Separation claw End roller OFF SL13 (cross section of end of transfer drum)	The image has been transferred to the copy paper; the separation claw solenoid (SL13) is OFF.
2	 Separation claw roller End roller Rim ON SL13	The separation claw solenoid (SL13) goes ON, bringing the end roller into contact with the rim of the transfer drum. The separation claw roller is kept away from the transfer drum sheet at a distance equivalent to the radius of the end roller.
3	 Separation roller Cut-off End roller Cut-off ON SL13	The separation claw solenoid (SL13) remains ON. The end roller slides down along the cut-off on the rim; at the same time, the separation claw roller slides over the same distance to move into the cut-off of the transfer drum sheet plate. This condition causes the copy paper to separate from the transfer drum.

Table 3-601 CLC200 A-Side Separation

b. B-Side Separation

As shown in Figure 3-612 , separation of copy paper retained on the transfer drum sheet is referred to as B-side separation.

The separation is by the separation claw and separation push-up roller; for details, see Table 3-602.

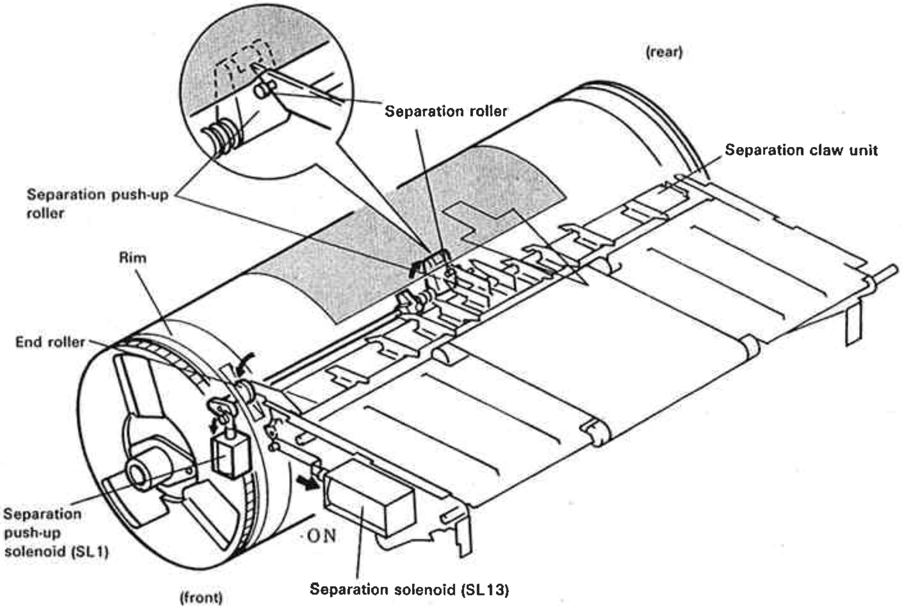

(rear)
Separation roller
Separation claw unit
Separation push-up roller
Rim
End roller
Separation push-up solenoid (SL1)
ON
Separation solenoid (SL13)
(front)

Figure 3-612 CLC200 B-Side Separation

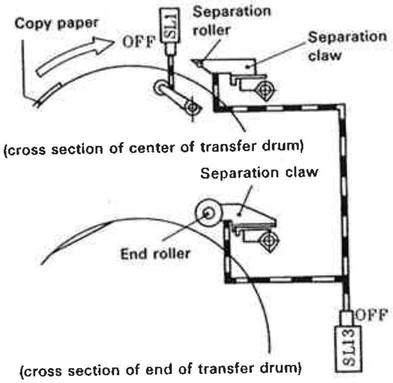
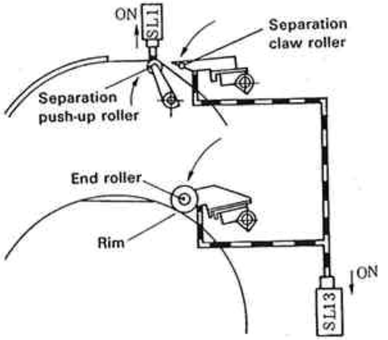
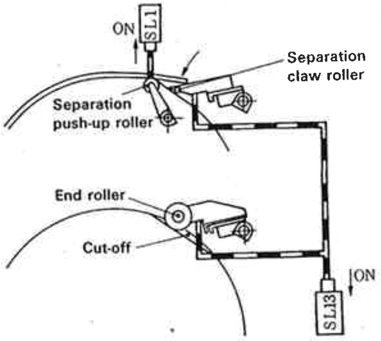
1	 Copy paper OFF SL1 Separation roller Separation claw (cross section of center of transfer drum) Separation claw End roller OFF SL13 (cross section of end of transfer drum)	The image has been transferred to the copy paper; the separation solenoid (SL13) and separation push-up solenoid (SL1) are OFF.
2	 ON SL1 Separation claw roller Separation push-up roller End roller Rim ON SL13	The separation claw solenoid (SL13) and separation push-up solenoid (SL1) go ON; the condition brings the end roller into contact with the transfer drum unit. The transfer claw roller is kept away from the transfer drum sheet at a distance equivalent to the radius of the end roller; further, the separation push-up roller pushes up the transfer drum sheet from inside by the work of SL1.
3	 ON SL1 Separation claw roller Separation push-up roller End roller Cut-off ON SL13	The separation solenoid (SL13) and separation push-up solenoid (SL1) remain ON. The separation push-up roller bends a section of the transfer drum sheet to increase the curvature. The end roller slides down along the cut-off to bring the separation claw roller in contact with the drum sheet; thereafter, the tip of the paper by its body leaves the transfer drum sheet, and the separation claw moves in to the gap to separate the paper.

Table 3-602 CLC200 B-Side Separation

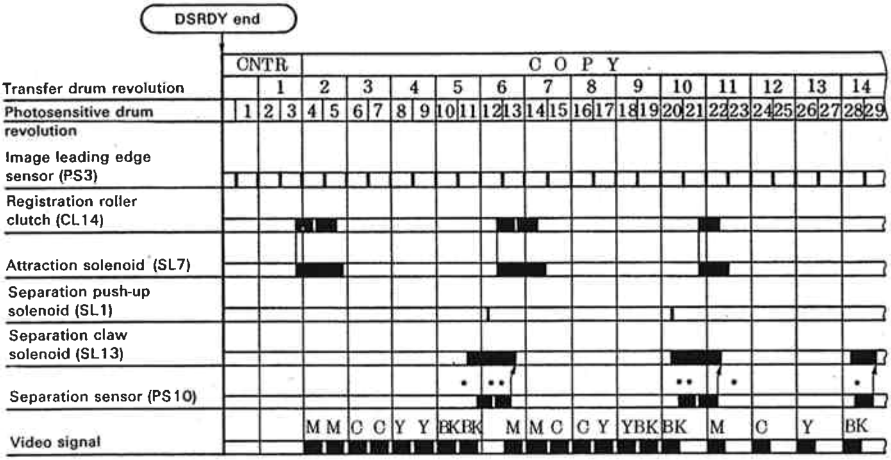

DSRDY end
CNTR
COPY
Transfer drum revolution
1 2 3 4 5 6 7 8 9 10 11 12 13 14
Photosensitive drum revolution
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29
Image leading edge sensor (PS3)
Registration roller clutch (CL14)
Attraction solenoid (SL7)
Separation push-up solenoid (SL1)
Separation claw solenoid (SL13)
Separation sensor (PS10)
*
**
Video signal
M M C C Y Y BK BK M M C C Y Y BK BK M C Y BK

Figure 3-613 A4/LTR, 5 Copies, Full-Color, DIRECT, Potential Control ON (CLC200)

* Paper attached as A-side.
** Paper attached as B-side.

5a. Separation Control (CLC300/350)

In the CLC300/350, separation is executed by the separation claws and the separation push-up roller regardless of the side (A, B, or C). See Table 3-603 for a diagram.

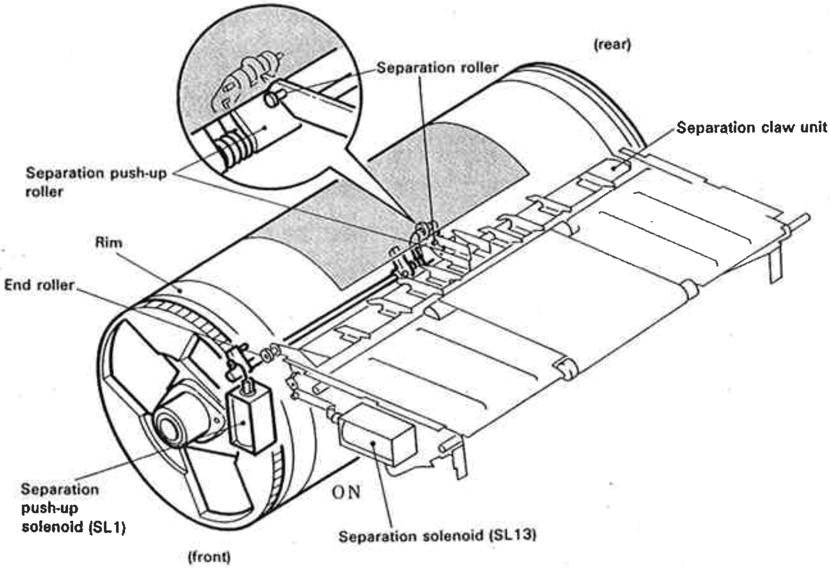

(rear)
Separation roller
Separation claw unit
Separation push-up roller
Rim
End roller
Separation push-up solenoid (SL1)
ON
Separation solenoid (SL13)
(front)

Figure 3-614 CLC300/350

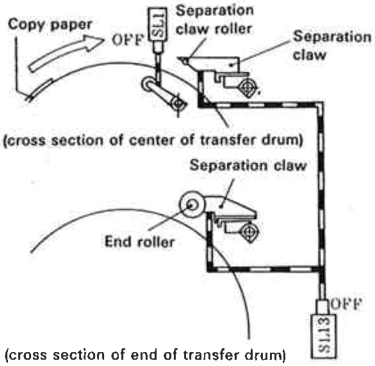
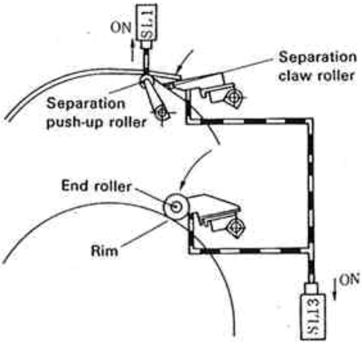
1	 Copy paper OFF SL1 Separation claw roller Separation claw (cross section of center of transfer drum) Separation claw End roller OFF SL13 (cross section of end of transfer drum)	The image has been transferred to the copy paper; the separation solenoid (SL13) and separation push-up solenoid (SL1) are OFF.
2	 ON SL1 Separation claw roller Separation push-up roller End roller Rim ON SL13	The separation claw solenoid (SL13) and separation push-up solenoid (SL1) go ON; the condition brings the separation claw roller into contact with the transfer drum seat. The transfer claw is kept away from the transfer drum sheet at a distance equivalent to the radius of the separation claw roller; further, the separation push-up roller pushes up the transfer drum sheet from inside by the work of SL1. The separation push-up roller bends a section of the transfer drum sheet to increase the curvature. Thereafter, the tip of the paper by its body leaves the transfer drum sheet, and the separation claw moves in to the gap to separate the paper.

Table 3-603 CLC300/350

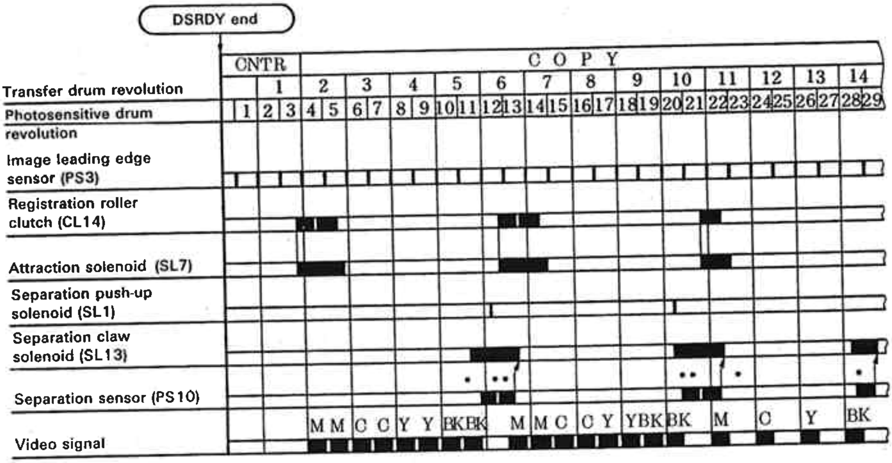

DSRDY end
CNTR
C O P Y
Transfer drum revolution
1 2 3 4 5 6 7 8 9 10 11 12 13 14
Photosensitive drum revolution
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29
Image leading edge sensor (PS3)
Registration roller clutch (CL14)
Attraction solenoid (SL7)
Separation push-up solenoid (SL1)
Separation claw solenoid (SL13)
Separation sensor (PS10)
Video signal
M M C C Y Y BK BK M M C C Y Y BK BK M C Y BK
*
**
**
*
*

Figure 3-615 A4/LTR, 5 Copies, Full-Color, DIRECT, Potential Control ON (CLC300/350)

* Paper attached as A-side.
** Paper attached as B-side.

6. Cleaning Mechanism for Transfer Drum

The transfer drum sheet, which retains and feeds copy paper, tends to attract foreign matter.

The presence of foreign matter on the transfer drum sheet leads to soiling of the back of paper and failure of attraction and transfer.

To prevent the problem, the outside brush serves to clean the surface of the transfer drum sheet.

To prevent deformation of the transfer drum sheet and enhance cleaning efficiency, the back of the transfer drum sheet is lifted by the inside brush.

The outside brush is rotated at a high speed by the transfer drum cleaner motor (M7) in the direction opposite the transfer drum sheet.

When the transfer cleaner solenoid (SL10) goes ON while the main motor (M1) is rotating, the drive from the main motor is relayed to the cam by way of the spring clutch. The rotation of the cam then serves to push the transfer drum cleaner against the transfer drum sheet.

The inside brush is pushed against the transfer drum sheet as the inside brush solenoid (SL2) goes ON and OFF.

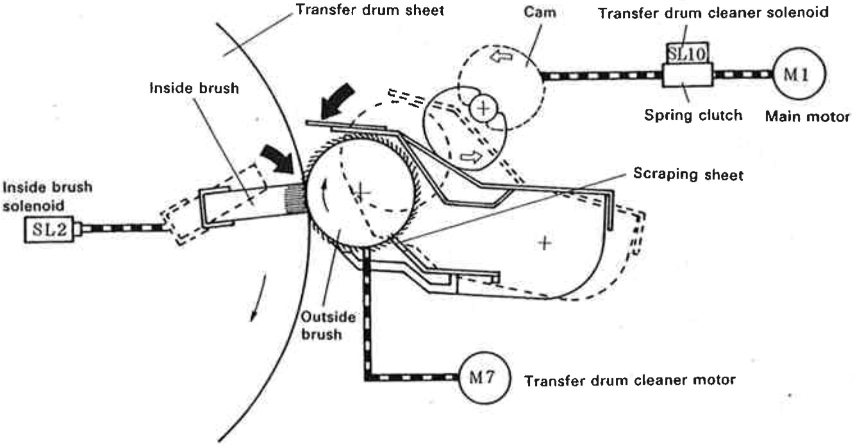

Transfer drum sheet
Cam
Transfer drum cleaner solenoid
SL10
M1
Inside brush
Spring clutch
Main motor
Scraping sheet
Inside brush solenoid
SL2
Outside brush
M7
Transfer drum cleaner motor

Figure 3-616

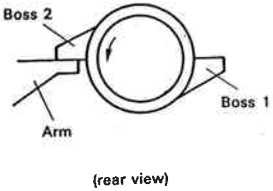

Boss 2
Boss 1
Arm
(rear view)

Figure 3-617 Control Cam

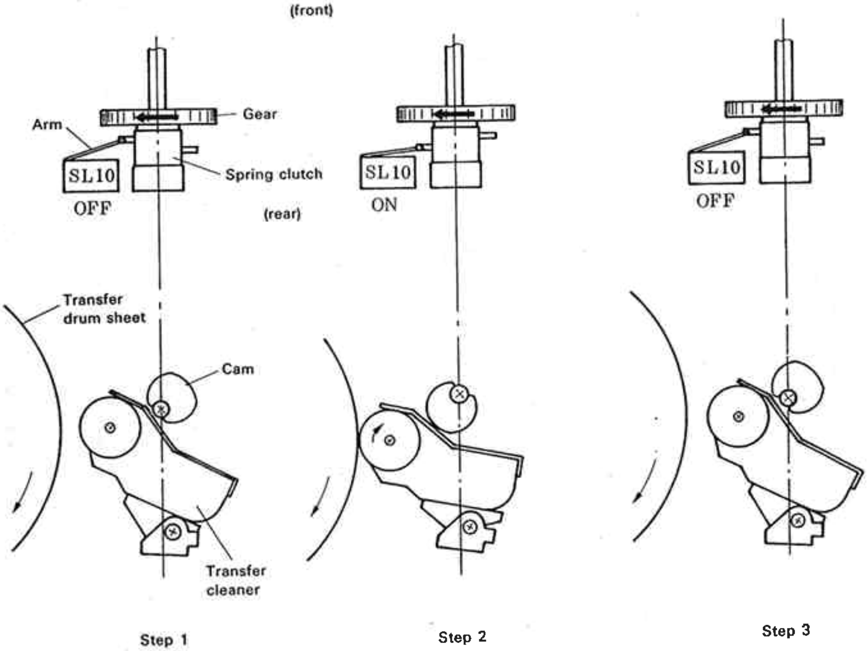

(front)
Arm
Gear
SL10
OFF
Spring clutch
(rear)
SL10
ON
SL10
OFF
Transfer drum sheet
Cam
Transfer cleaner
Step 1
Step 2
Step 3

Figure 3-618

The transfer drum is cleaned at the time last rotation takes place.

The position of toner for black toner concentration detection performed with reference to the photosensitive drum corresponds to the position of the transfer sheet plate with reference to the transfer drum.

For this reason, the sections of the transfer drum sheet plate are cleaned an extra more than other sections of the transfer drum sheet unit.

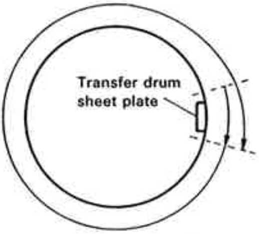
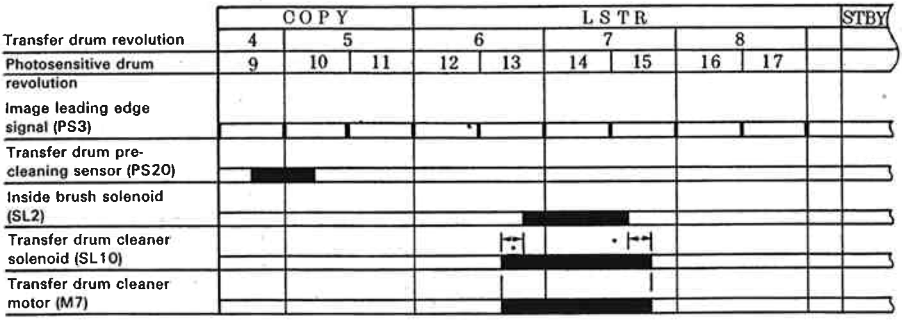

Transfer drum sheet plate

Figure 3-619

The inside brush is released at the transfer drum sheet plate so as to prevent deformation of the inside brush otherwise caused by interference between the transfer drum sheet plate and inside brush.

To prevent soiling the attraction roller, the CLC300/350 presses on the attraction roller and generates high voltage from the attraction corona assembly during drum toner density control (SALT), thereby moving the toner from the attraction roller to the transfer drum sheet and cleaning it by an external brush.


COPY
LSTR
STBY
Transfer drum revolution
4
5
6
7
8
Photosensitive drum revolution
9
10
11
12
13
14
15
16
17
Image leading edge signal (PS3)
Transfer drum pre-cleaning sensor (PS20)
Inside brush solenoid (SL2)
Transfer drum cleaner solenoid (SL10)
Transfer drum cleaner motor (M7)

* The inside brush is released at the transfer drum sheet plate.

Figure 3-620 A4/LTR, 1 Copy, Full-Color, DIRECT

7. Fixing Assembly and Feeder Unit Control

The copy paper separated from the transfer drum is moved to the fixing assembly through the feeder unit.

In the case of an OHP sheet, the speed of the feeder unit and fixing assembly is lowered to about one-third as soon as its leading edge reaches the inlet of the fixing assembly to enhance fixing efficiency.

Figure 3-621 shows the flow of drive when paper is moved at normal speed.

Figure 3-622 shows the flow of drive when paper is moved at a speed 1/3 of normal.

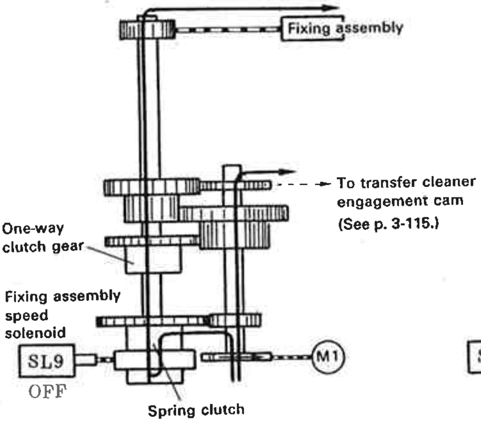

Fixing assembly
To transfer cleaner engagement cam
(See p. 3-115.)
One-way clutch gear
Fixing assembly speed solenoid
SL9
OFF
M1
Spring clutch

Figure 3-621 (top view)

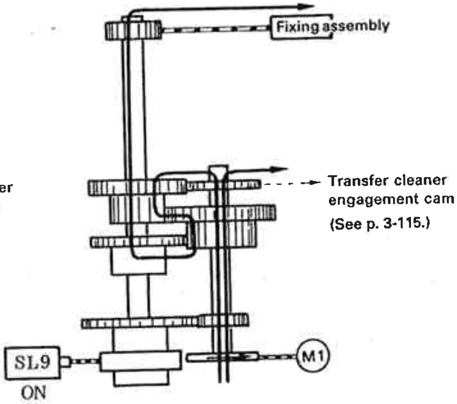

Fixing assembly
Transfer cleaner engagement cam
(See p. 3-115.)
SL9
ON
M1

Figure 3-622 (top view)

Note:
Figures 3-621 and -622 show the flow of drive used for the fixing assembly; the same flow is used for the feeder unit.

D. Fixing Assembly and Delivery Unit

1. Outline

The main motor (M1) serves to drive all following loads:

- Upper fixing roller
- Lower fixing roller
- Delivery roller
- Oil application felt

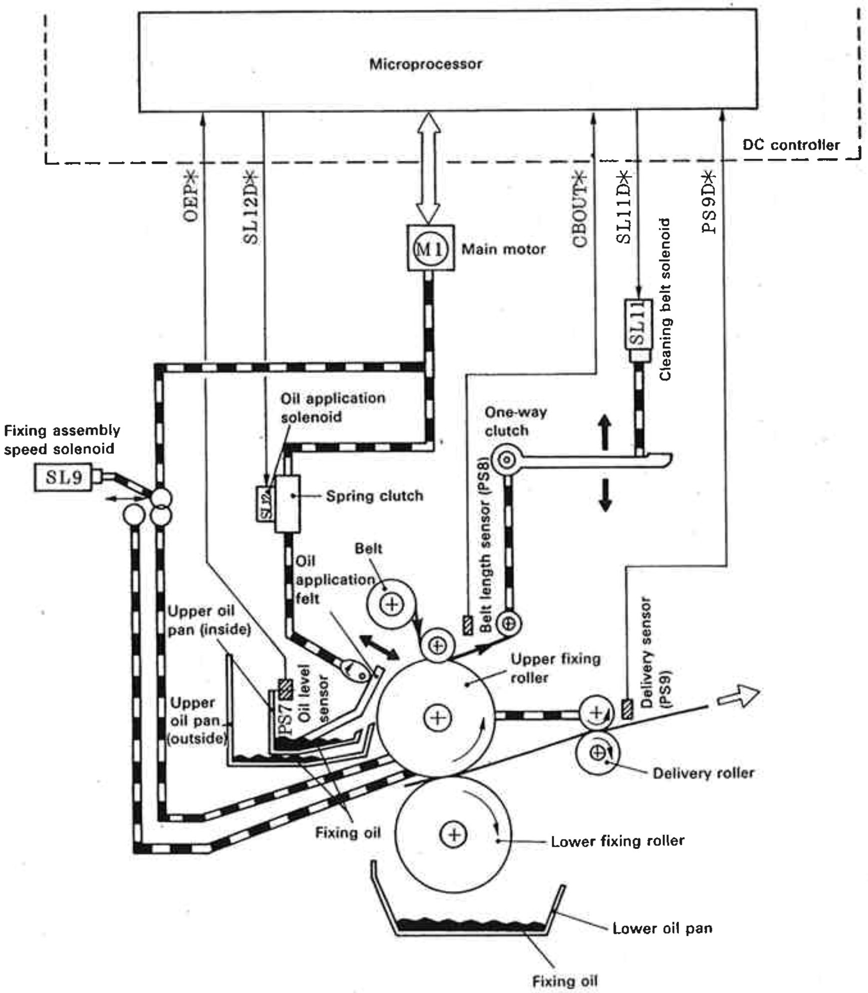

Microprocessor
DC controller
OEP*
SL12D*
M1
Main motor
CBOUT*
SL11D*
PS9D*
SL11
Cleaning belt solenoid
Fixing assembly speed solenoid
SL9
Oil application solenoid
SL12
Spring clutch
One-way clutch
Belt length sensor (PS8)
Belt
Oil application felt
Upper oil pan (inside)
Upper oil pan (outside)
PS7 Oil level sensor
Upper fixing roller
Delivery sensor (PS9)
Delivery roller
Fixing oil
Lower fixing roller
Lower oil pan
Fixing oil

Figure 3-623

2. Fixing Roller Temperature Control

The upper roller and lower roller are heated by fixing heaters (H1, H2; 400 W, each), and the surface temperature of the lower roller is monitored by a thermistor (TH1).

Surface temperature of fixing assembly is 'high'.
└→Resistance of thermistor (TH1) is 'low'.
  └→Voltage of fixing roller surface temperature signal (FRST) is 'low'.

Surface temperature of fixing assembly is 'low'.
└→Resistance of thermistor (TH1) is 'high'.
  └→Voltage of fixing roller surface temperature signal (FRST) is 'high'.

Based on the voltage of FRST, the microprocessor on the DC controller controls the state, i.e., '1' or '0', of the upper fixing heater drive signal (UHTRD*) and lower fixing heater drive signal (LHTRD*) to maintain the surface temperature of the upper and lower rollers at a specified value.

During copy run	controlled at 143 (150)°C
During standby	controlled at 143 (150)°C
During pre-heat	controlled at 123 (130)°C

The values in parentheses represent the temperature of the fixing roller actually measured.

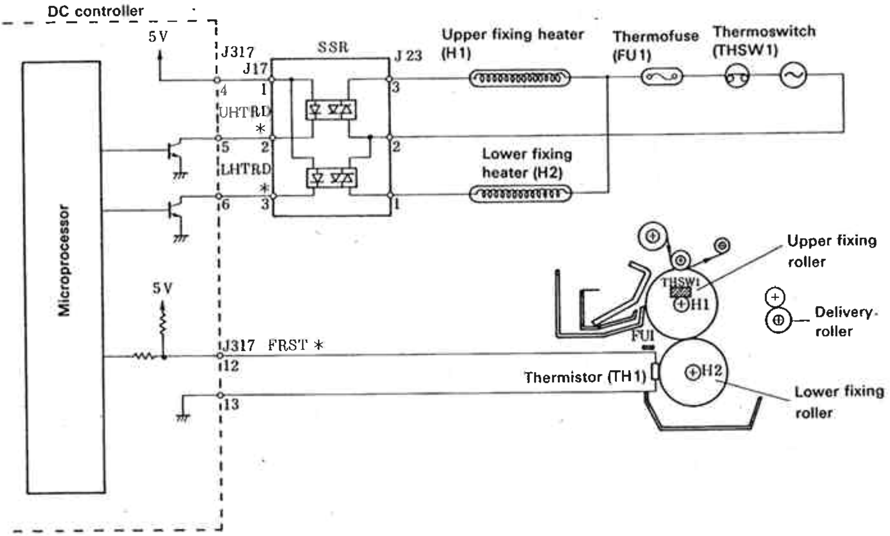

DC controller
5V
J317
J17
4
1
UHTRD
*
5
2
LHTRD
*
6
3
SSR
J23
3
2
1
Upper fixing heater (H1)
Thermofuse (FU1)
Thermoswitch (THSW1)
Lower fixing heater (H2)
Microprocessor
5V
J317 FRST *
12
13
Thermistor (TH1)
THSW1
H1
FU1
H2
Upper fixing roller
Delivery roller
Lower fixing roller

Figure 3-624

The CLC200/300/350 is equipped with three types of protection mechanism to prevent faulty operation of the fixing heater.

- The microprocessor monitors the voltage of TH1 and, if a fault occurs, indicates 'E000'.
- The thermoswitch goes OFF if its inside temperature exceeds 210°C to cut off the power to the fixing heater.
- The thermal fuse blows if the temperature around it exceeds 152°C to cut off the power to the fixing heater.

Note:
Once open, the contact of the thermoswitch (THSW1) will not recover unless it is cooled to 0°C or less. It will not recover at room temperature.

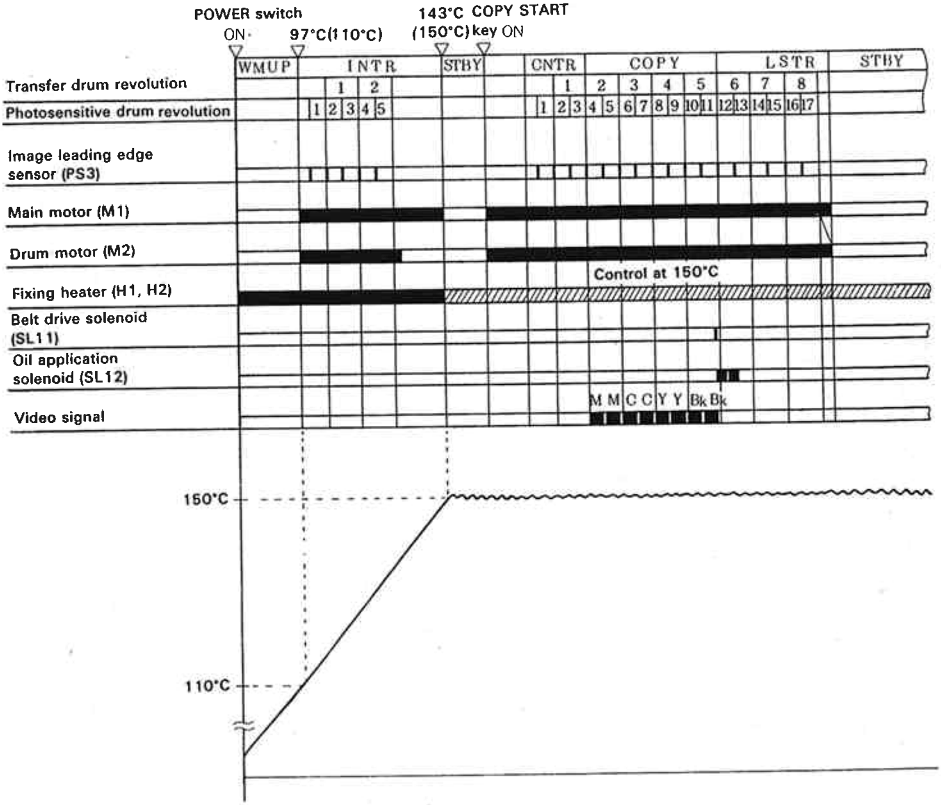

POWER switch ON
97°C(110°C)
143°C (150°C)
COPY START key ON
WMUP
INTR
STBY
CNTR
COPY
LSTR
STBY
Transfer drum revolution
1 2
1 2 3 4 5 6 7 8
Photosensitive drum revolution
1 2 3 4 5
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17
Image leading edge sensor (PS3)
Main motor (M1)
Drum motor (M2)
Fixing heater (H1, H2)
Control at 150°C
Belt drive solenoid (SL11)
Oil application solenoid (SL12)
Video signal
M M C C Y Y Bk Bk
150°C
110°C

Figure 3-625 A4/LTR, 2 Copies, Full-Color, DIRECT, Potential Control ON

3. Cleaning Belt Drive

The belt used to clean the upper fixing roller is driven by the cleaning belt solenoid (SL11), which is operated by the state, i.e., '1' or '0', of the belt drive signal (SL11D).

The belt is taken up 0.45 mm each time the cleaning belt solenoid goes ON. The cleaning belt solenoid, further, goes ON and OFF as many times as necessary to suit the length of the copy paper; see Table 3-604 .

Size of copy	ON/OFF operations
S-size (182 to 216 mm)	Once for each 15 copies
L-size (217 to 432 mm)	Once for each 7.5 copies

Table 3-604

Note:
For OHP sheets, it goes ON for each two copies (approx.).

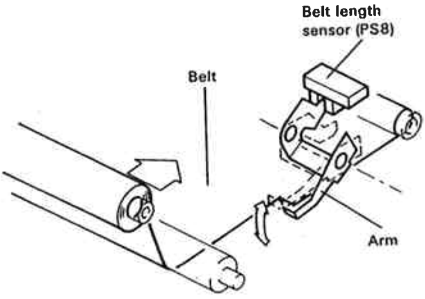


Figure 3-626

The end of the belt is provided with a cut for detection of the length that remains.

When the belt has been taken up to the point at which the cut is made, the arm which has been supported by the belt falls through the cut and is detected by the belt length sensor (PS8).

The sensor, in response, indicates a warning message on the control panel.

Note:

i. An error code will be indicated after the cleaning belt solenoid has gone ON and OFF about 270 times and the warning is indicated.

ii. The belt is 5 m long (4.7 m to the cut).

iii. Be sure to clear the counter for the belt (service mode) after replacing the cleaning belt.

4. Oil Application Mechanism

During a copy run, the oil application solenoid (SL12) goes ON to bring the oil application felt in contact with the upper fixing roller. The felt is used to apply silicone oil on the roller to prevent offset.

SL12 remains ON for a period of time equivalent to the size (lengthwise) of the copy paper.

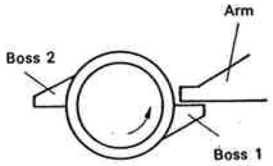
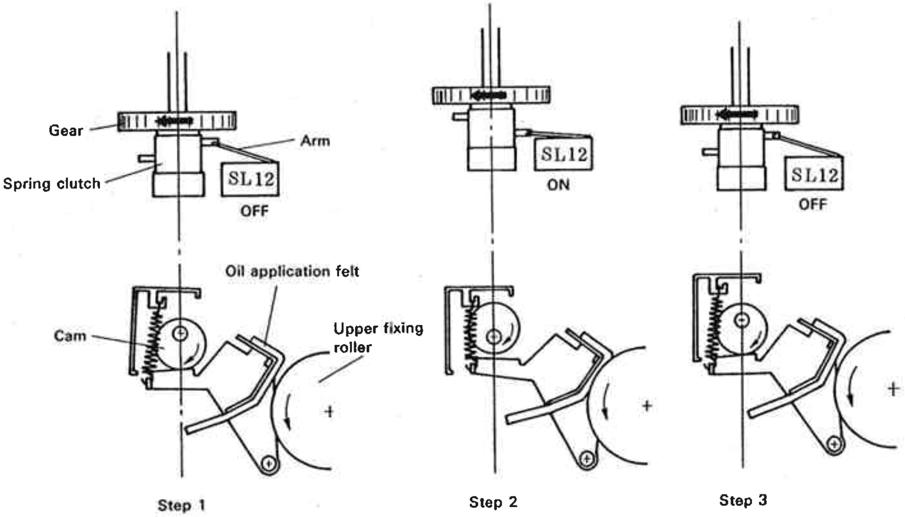

Arm
Boss 2
Boss 1

Figure 3-627 Control Cam


Gear
Arm
Spring clutch
SL12
OFF
Oil application felt
Cam
Upper fixing roller
SL12
ON
SL12
OFF

Step 1 Step 2 Step 3

Figure 3-628

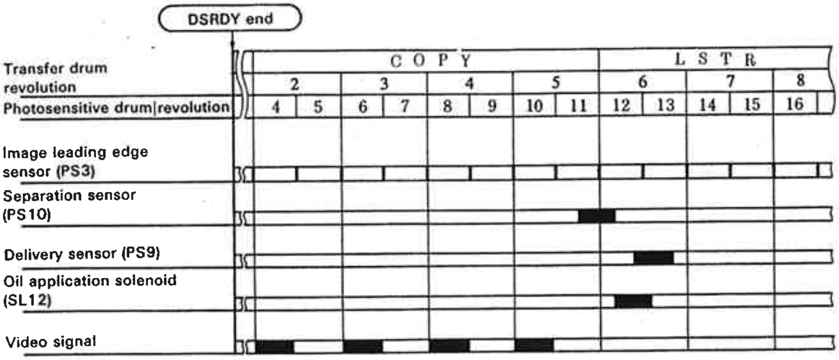


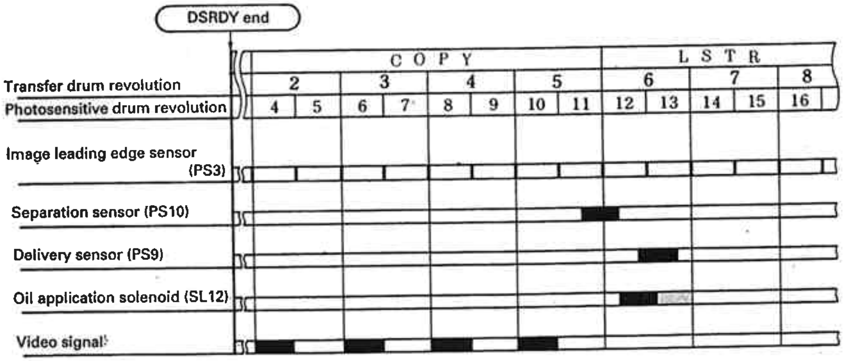
Figure 3-629 A4, LTR, Full-Color, DIRECT, Pontential Control ON (CLC200/300)

As a rule, the oil application solenoid (SL12) remains ON while copy paper is moving under the fixing roller.

In the case of the CLC350, the solenoid goes ON after copy paper has moved past the roller when copying on the first side of a two-sided copy (two-sided mode) to limit the oil on the first side, thereby preventing the oil on the first side from sticking to the transfer drum sheet.

Note:

1. When copying on the first side, oil applied to the copy paper will increase if a cassette is used or if the manual mode is used instead of pressing the TWO-SIDED key. Copying on the second side in this way would cause the fixing oil to stick to the transfer sheet and the photosensitive drum, affecting the quality of copies.
2. When copying on the second side, inadequate amounts of fixing oil may be supplied if the TWO-SIDED key has not been pressed to cancel the two-sided mode, thereby causing offset to the fixing roller.
3. The TWO-SIDED key is valid only when the manual mode is selected; in other modes, a press on the key will not provide expected effect.


DSRDY end
COPY
LSTR
Transfer drum revolution
2
3
4
5
6
7
8
Photosensitive drum revolution
4
5
6
7
8
9
10
11
12
13
14
15
16
Image leading edge sensor (PS3)
Separation sensor (PS10)
Delivery sensor (PS9)
Oil application solenoid (SL12)
Video signal

■ non-manual two-sided mode

▨ manual two-sided mode

Figure 3-630 A4/LTR, 4 Colors, DIRECT, Potential Control ON (CLC350)

5. Fixing Oil Application Mechanism

The CLC200/300's fixing oil is circulated as shown in Figure 3-632.

The CLC350, on the other hand, is equipped with a bag for waste oil inside the oil bottle and, instead of circulating the oil, it collects waste oil from the fixing assembly.

The oil inside the oil bottle is pumped up to the upper oil pan by the oil pump solenoid (SL15).

The level of the silicone oil in the upper oil pan is monitored by the oil level sensor (PS7), as shown in Figure 3-631, with reference to the position of the arm of the float in the upper oil pan.

If PS7 does not detect the arm when the power is turned ON, SL15 keeps going ON and OFF until it detects the arm.

If PS7 does not detect the arm after a period of five minutes in which SL15 is operated, the 'NO OIL' message will be indicated.

The oil application felt, in addition to the filter inside the oil pump solenoid, also serves as a filter for the circulating silicone oil.

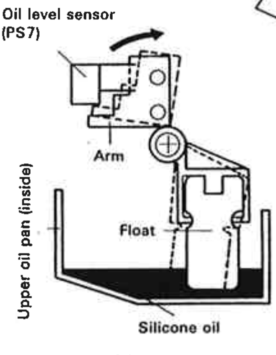

Oil level sensor
(PS7)
Arm
Upper oil pan (inside)
Float
Silicone oil
——— Oil is present.
------- Oil is absent.

Figure 3-631

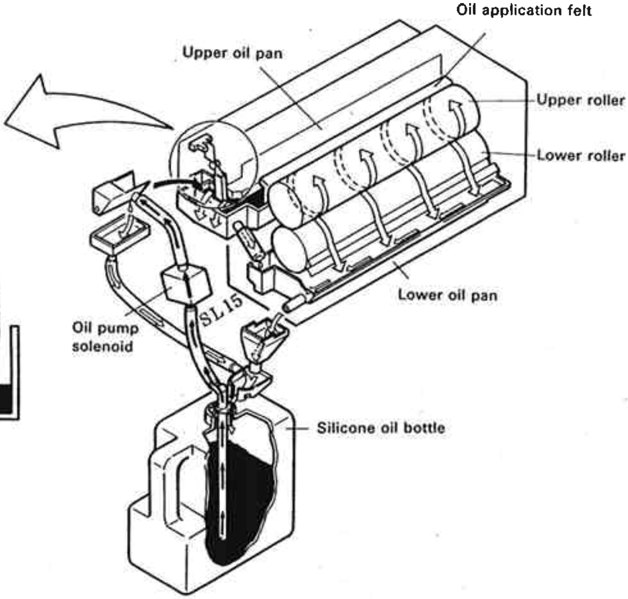

Oil application felt
Upper oil pan
Upper roller
Lower roller
Lower oil pan
SL15
Oil pump solenoid
Silicone oil bottle

Figure 3-632

E. Jam Detection

The CLC200/300/350 is equipped with the following sensors to check the presence/absence of copy paper or if the paper is fed normally.

- OHP sensor (pre-registration sensor)
- Attraction jam sensor (PS18)
- Transfer jam sensor (PS19)
- Separation sensor (PS10)
- Pre-cleaning transfer drum sensor (PS20)
- Delivery sensor (PS9)

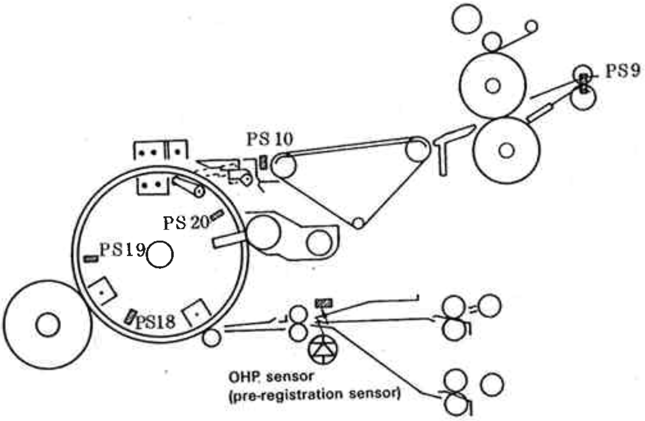


Figure 3-633

The presence/absence of paper or a jam is checked with reference to the presence/absence of paper at the respective sensor at such times as instructed by the microprocessor.

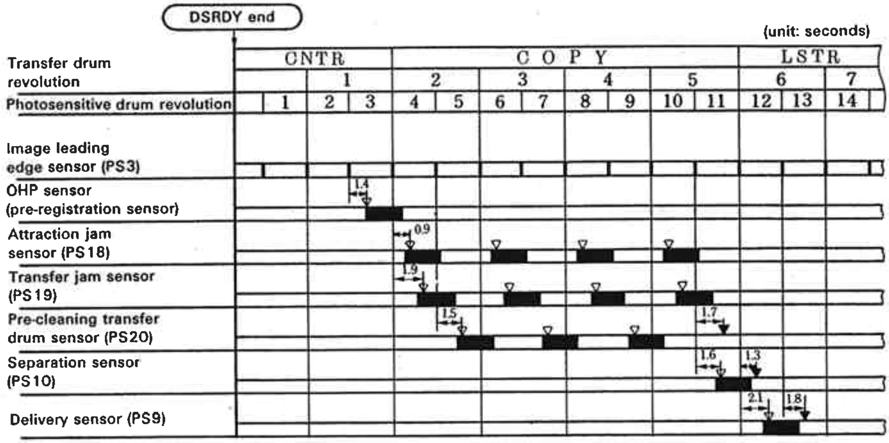
The CLC200/300/350 is equipped with a mechanism which retains the number of copies remaining and copy mode to meet each occurrence of jams; as such, the number need not be set each time the machine is opened and closed for removal of jams.

If the OHP sensor (pre-registration sensor), separation sensor (PS10), or delivery sensor (PS9) detects paper at time of power-on, the condition is identified as a jam.

Likewise, if any two of the attraction jam sensor (PS18), transfer jam sensor (PS19), and pre-cleaning transfer drum sensor (PS20) detect paper at the same time, the condition is also identified as a jam.

If only one of these sensors detects paper, a check is made at the home position of the transfer drum after the transfer drum has rotated once again; if any of the sensors detects paper at this time, the condition is identified as a jam.

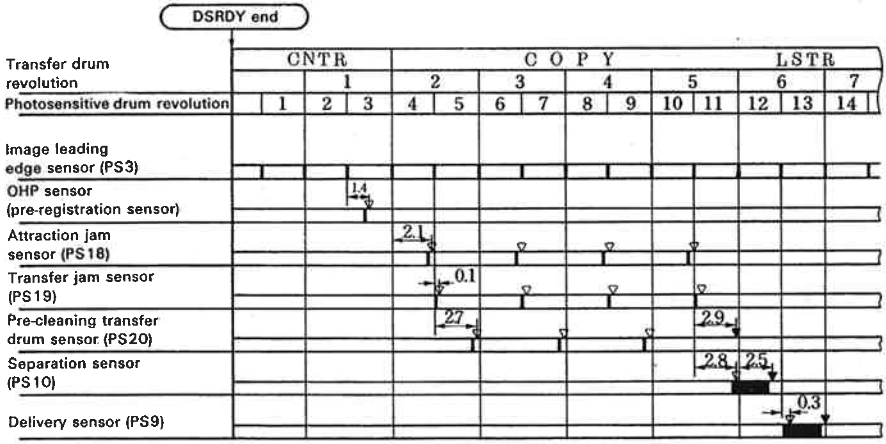
If a pick-up jam occurs in the continuous copy mode, the operation continues until copying is over for the sheet that has already been picked up.



▽ : Delay jam check (normal, if paper is present)

▼ : Stationary jam check (normal, if paper is absent)

Figure 3-634 A4/LTR, 4-Color, 1 Copy, DIRECT, Pick-Up from Upper Cassette, Potential Control ON

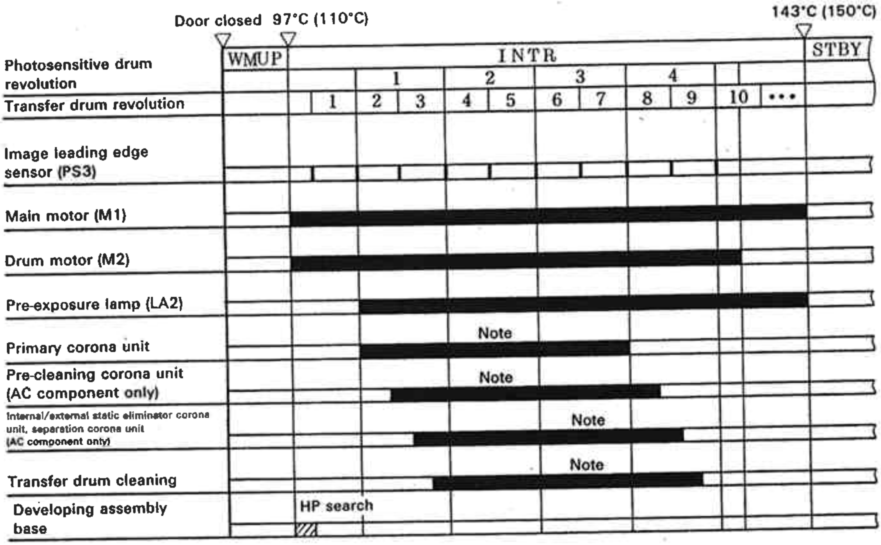


▽ : Delay jam check (normal, if paper is present)

▼ : Stationary jam check (normal, if paper is absent)

Figure 4-635 A4/LTR, OHP Sheet, 1 Copy, 4-Color, DIRECT, Pick-Up from Manual Feed Tray, Potential Control ON

The sequence of operations when the front door is closed after removal of a jam will be as follows:



Note:
In the case of the CLC300/350, ON for 4 rotations.

Figure 3-636

F. Offset Tray

A. Mechanism

The offset tray sorts the copies coming out of the copying machine when the SORT* or GROUP mode is selected on the machine.

* Effective only when a feeder is attached.

1. SORT Mode*

* Effective only when a feeder is attached.

Use the mode to make a plural number of copies from a plural number of documents; the copies will be arranged according to their pages.

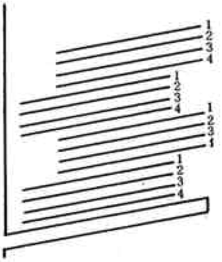


Figure 3-637

2. GROUP Mode

Use the mode to make a plural number of copies of a plural number of documents; the copies will be arranged according to their documents.

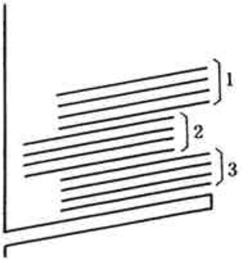


Figure 3-638

B. Mechanism

The DC controller PCB of the copying machine serves to cause the shift signal to go '0' and the shift motor (DM1) to rotate to shift the offset tray.

The cam is driven by DM1 and is equipped with two bosses intended for the motor stop switch (MS1); the bosses are arranged opposite each other.

DM1 stops as soon as MS1 is pressed by any of the bosses; during each half turn, the offset tray moves from the front to the rear or from the rear to the front to sort the copies.

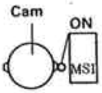
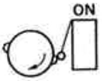
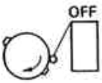
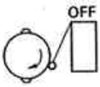
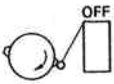
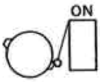
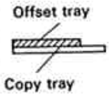
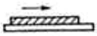
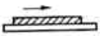
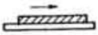
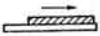
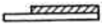
Cam and MS1	 Cam ON MS1	 ON	 OFF	 OFF	 OFF	 ON
SHIFT signal	1	0	1	1	1	1
DM1	At rest.	In rotation.	In rotation.	In rotation.	In rotation.	At rest.
Offset tray position	 Offset tray Copy tray					

Figure 3-639

VII. CONTROL PANEL

The control panel consists of the liquid crystal display (includes lamp, lamp driver) and operation key/LED PCB.

The lamp driver, when the LCD lamp ON signal (LCDLA✳) goes '0', causes the LCD lamp to go ON at a high frequency.

The LCD unit, according to the display data selected by the image processor PCB, controls the LCD panel.

The operation key/LED PCB consists of keys and LEDs wired in the form of a matrix, and the PCB of the image processor serves to cause the LEDs to go ON and to read the keys.

Note:
The contrast of the LCD panel can be adjusted by turning VR1 on the LCD control unit.

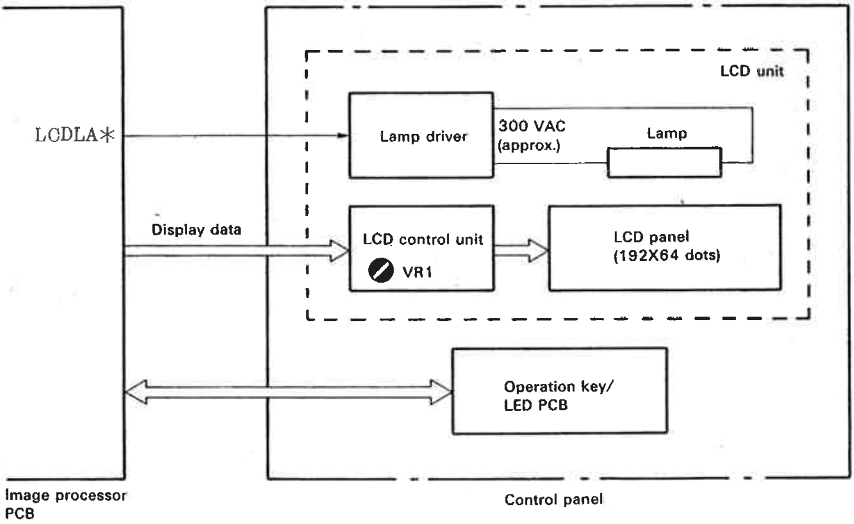

LCDLA✳
Display data
LCD unit
Lamp driver
300 VAC (approx.)
Lamp
LCD control unit
VR1
LCD panel (192X64 dots)
Operation key/ LED PCB
Image processor PCB
Control panel

Figure 3-700

VIII. IMAGE EDITING UNIT

A. Outline

The image editing unit used with the CLC200/300/350 is what is known as a static type and consists of a tablet and pen switch, which are used to read coordinates in the horizontal (X) and vertical (Y) directions.

The controller PCB reads the area enclosed by presses of the pen switch as the area specified.

The tablet has electrode wires arranged at intervals of 6 mm; the static contact between the electrodes and pen switch is used to identify the point of input.

B. Mechanism

When the pen switch presses the tablet, the CPU on the controller PCB sends pulses to each electrode by way of the decoders (X, Y) of the tablet; the pulses are sent in order of 1, 2, ... n-1, n+1.

Static contact occurs between these pulses and the pen switch, and the degree of the voltage is read into the controller PCB by way of the pen switch; see Figure 3-801.

The voltage so read is converted into digital signals by the A/D converter circuit of the controller PCB; the signals are further converted in terms of an area in units of millimeters by computation in the CPU, and the resulting data are sent to the copying machine.

Note:
The method (static contact) adopted for the image editing unit allows the use of a thick document (4 mm or less).

Objects made of conductive material, contact sensitive material, or carbon back, however, cannot be used.

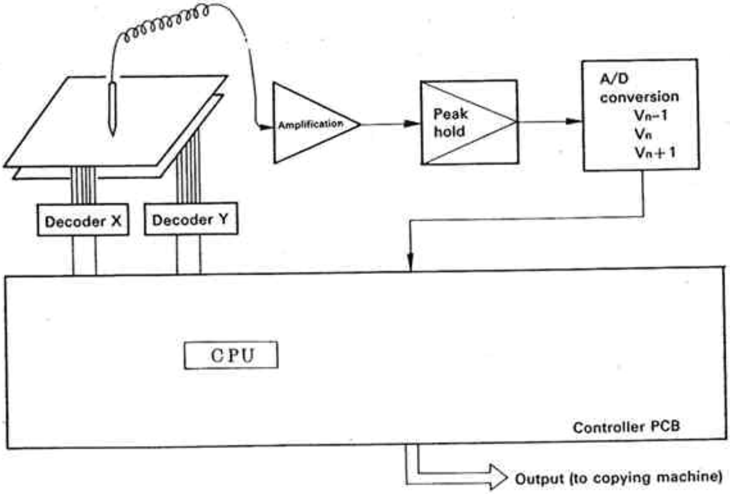
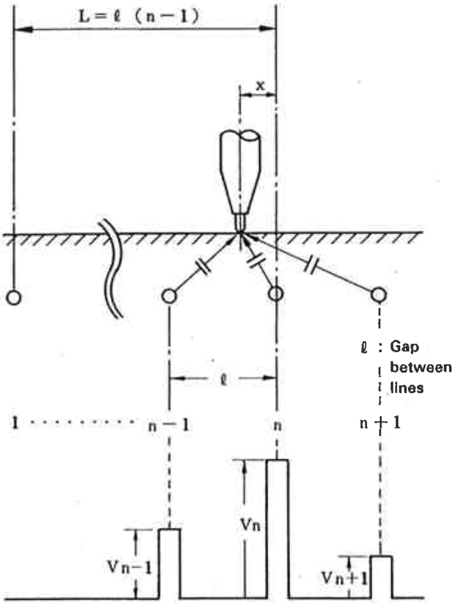


Figure 3-800


L = ℓ (n − 1)
x
ℓ : Gap between lines
ℓ
1 ·········· n − 1
n
n + 1
Vn
Vn−1
Vn+1

Note:
Mechanism of Detection

Pulses are applied on electrode wires; 1, . . . , n−1, n, n+1.

⇩

maximum value V_n at nth electrode
∴ L: ℓ (n−1)
ℓ: gap between lines

⇩

$V_n-(V_{n-1}) = S$ and $V_n-(V_{n+1}) = S$ are obtained; x is computed from data table.

⇩

L ±x mm is obtained.
⊕. . . when between n and n+1
⊖. . . when between n and n−1

Figure 3-801

C. Zero-Adjustment for Input Coordinates

When the controller PCB or tablet of the image editing unit has been replaced, it is important to set the DIP switch inside the controller PCB according to the record kept on the tablet cable; see Figures 3-802 and -803.

If the coordinates still have a discrepancy, enter the service mode and make adjustments under 'EDADJ-X, Y'.

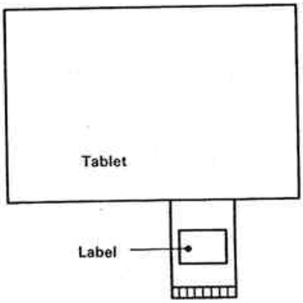
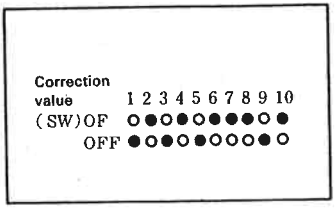


Figure 3-802



Correction value	1	2	3	4	5	6	7	8	9	10
(SW)OF	○	●	○	●	○	●	●	●	○	●
OFF	●	○	●	○	●	○	○	○	●	○

Figure 3-803 Display Example (●: Setting)

IX. FAN

The CLC200/300/350 is equipped with nine fans to exhaust ozone, collect stray toner, and cool its parts. Table 3-900 shows the function and orientation of each fan and the type of filter attached; Figure 3-901 shows the timing at which each fan goes ON.

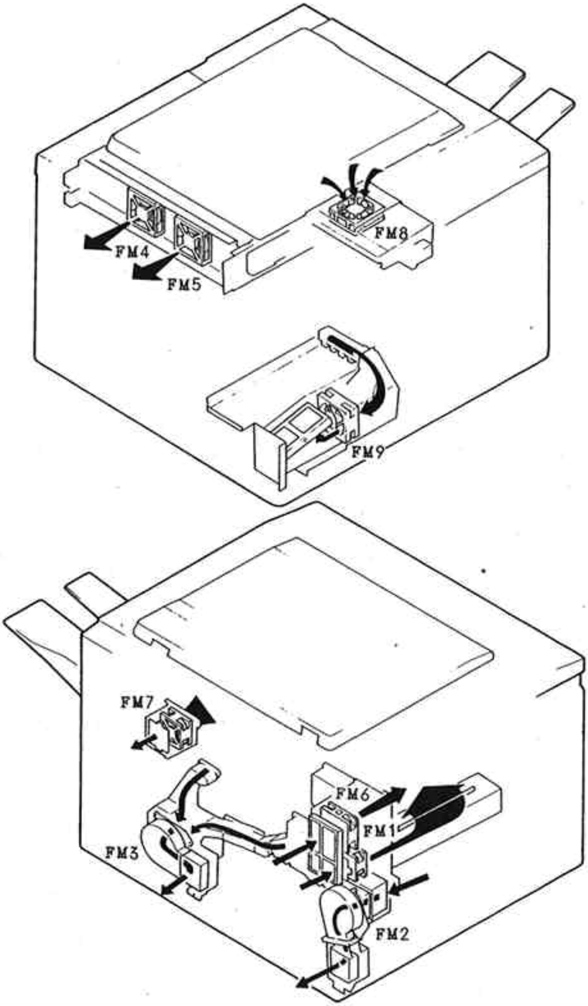


Figure 3-900

Ref.	Fan	Orientation	Filter	Function
FM1	Primary corona unit fan	Blowing	Air	Blows air against the primary corona unit to prevent collection of ozone.
FM2	Ozone exhaust fan	Vacuuming	Ozone Air	Takes in the ozone generated by the primary/pre-cleaning corona unit.
FM3	Toner suction fan	Vacuuming	Ozone Air	• Takes in toner collected by the transfer drum cleaner. • Takes in stray toner near the photosensitive drum cleaner. • Vacuums the rear of the black toner level sensor and potential sensor to prevent soiling of the sensors with toner.
FM4	Document exposure system cooling fan 1	Vacuuming		Prevents over-heating of the CCD and copyboard glass otherwise caused by the scanning lamp.
FM5	Document exposure system cooling fan 2	Vacuuming		
FM6	Laser/power supply cooling fan	Blowing	Air	Prevents over-heating of the laser element and DC power supply.
FM7	Fixing exhaust fan	Vacuuming	Air	• Prevents over-heating of the inside of the machine otherwise caused by the fixing heater. • Takes in vapor of silicone oil.
FM8	Feeder fan	Vacuuming		Keeps copy paper on the feeder belt.
FM9	Development fan	Vacuuming	Air	Takes in stray toner under the hopper unit.

Table 3-900

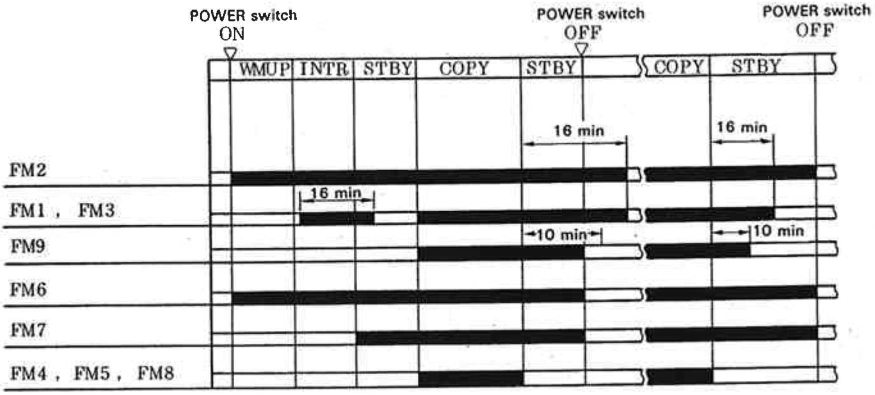

POWER switch ON
POWER switch OFF
POWER switch OFF
WMUP
INTR
STBY
COPY
STBY
COPY
STBY
16 min
16 min
FM2
16 min
FM1, FM3
10 min
10 min
FM9
FM6
FM7
FM4, FM5, FM8

Figure 3-901

X. POWER SUPPLY

A. Power Supply

Figures 3-1000, -1001, and -1002 show how power is distributed in the CLC 300.

DC power supply 1 is supplied with AC power in two channels; AC2 goes ON and OFF in response to the position of the POWER switch, but AC1 will not go OFF even when the POWER switch is turned OFF.

The following outputs are made available by DC power supply 1.

- Independent of POWER switch:
  +24 VF, +5 VL, +24 VL
- Dependent on POWER switch:
  +24 VU, +24 VR, +5 V, +8 V, -8 V, +12 V

+24 VU and +24 VR are sent when the remote signal from the DC controller goes ON; DC power supply 1 sends +24VF, +5VL, +24 VL, +5 V, +8 V, -8 V, and +12 V when it is supplied with AC power. When the CPU on the DC controller is supplied with +5 V and goes ON, the CPU causes the remote signal to DC power supply 1 to go ON to send +24 VU and +24 VR.

Disconnect the power plug whenever the DC power supply is removed or replaced; in particular, keep in mind that DC power supply 1 is provided with AC power regardless of the switch position.

B. Protection Mechanism for Power Supply Circuitry

The input side of the AC power supply is equipped with a fuse, and the output side of the DC power supply is equipped with an over-current protection circuit.

If an over-current flows because of a short circuit in a DC load, the protection circuit is activated to cut off the output of the DC power supply PCB.

Should such a condition occur, turn the POWER switch OFF, disconnect the plug, and remove the cause; thereafter, turn the POWER switch ON. The protection circuit keeps the AC power supply of the DC power supply PCB OFF for about 30 seconds; it may be reset by turning the AC power supply ON once again.

It is important to note, however, that repeated short-circuiting and re-setting can lead to blowing of the fuse built into the DC power supply PCB.

⚠ CAUTION: Replace the lithium battery only with the one listed in the Parts Catalog. Use of another battery may present a risk of fire or explosion.
The battery may present a fire or chemical burn hazard if mistreated. Do not recharge, disassemble or dispose of in fire.
Keep the battery out of reach of children and discard used battery promptly.

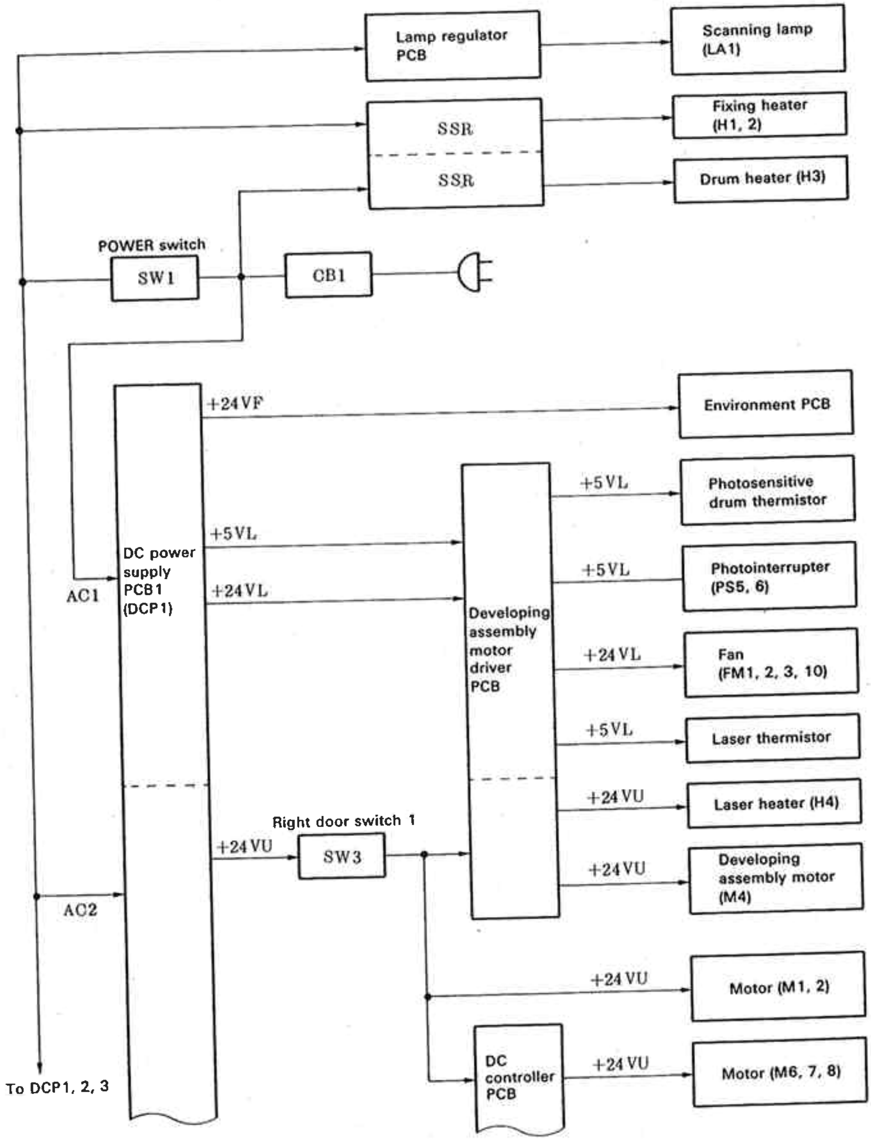

Lamp regulator PCB
Scanning lamp (LA1)
SSR
Fixing heater (H1, 2)
SSR
Drum heater (H3)
POWER switch
SW1
CB1
+24VF
Environment PCB
+5VL
Photosensitive drum thermistor
+5VL
DC power supply PCB1 (DCP1)
AC1
+24VL
+5VL
Photointerrupter (PS5, 6)
Developing assembly motor driver PCB
+24VL
Fan (FM1, 2, 3, 10)
+5VL
Laser thermistor
+24VU
Laser heater (H4)
Right door switch 1
+24VU
SW3
+24VU
Developing assembly motor (M4)
AC2
+24VU
Motor (M1, 2)
DC controller PCB
+24VU
Motor (M6, 7, 8)
To DCP1, 2, 3

Figure 3-1000

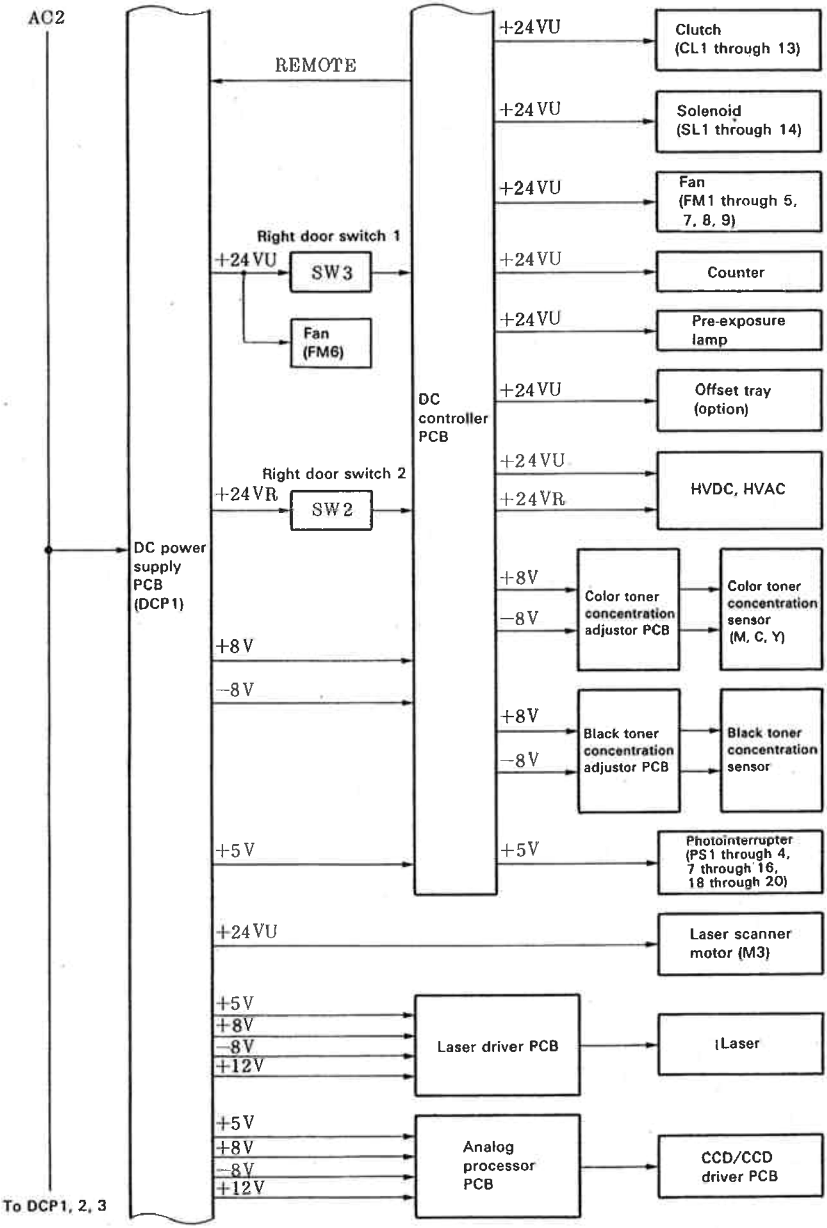

AC2
REMOTE
+24VU
Clutch
(CL1 through 13)
Solenoid
(SL1 through 14)
Fan
(FM1 through 5, 7, 8, 9)
Right door switch 1
SW3
Fan
(FM6)
Counter
Pre-exposure lamp
Offset tray (option)
DC controller PCB
Right door switch 2
+24VR
SW2
HVDC, HVAC
DC power supply PCB (DCP1)
+8V
−8V
Color toner concentration adjustor PCB
Color toner concentration sensor (M, C, Y)
Black toner concentration adjustor PCB
Black toner concentration sensor
+5V
Photointerrupter (PS1 through 4, 7 through 16, 18 through 20)
Laser scanner motor (M3)
+12V
Laser driver PCB
Laser
Analog processor PCB
CCD/CCD driver PCB
To DCP1, 2, 3

Figure 3-1001

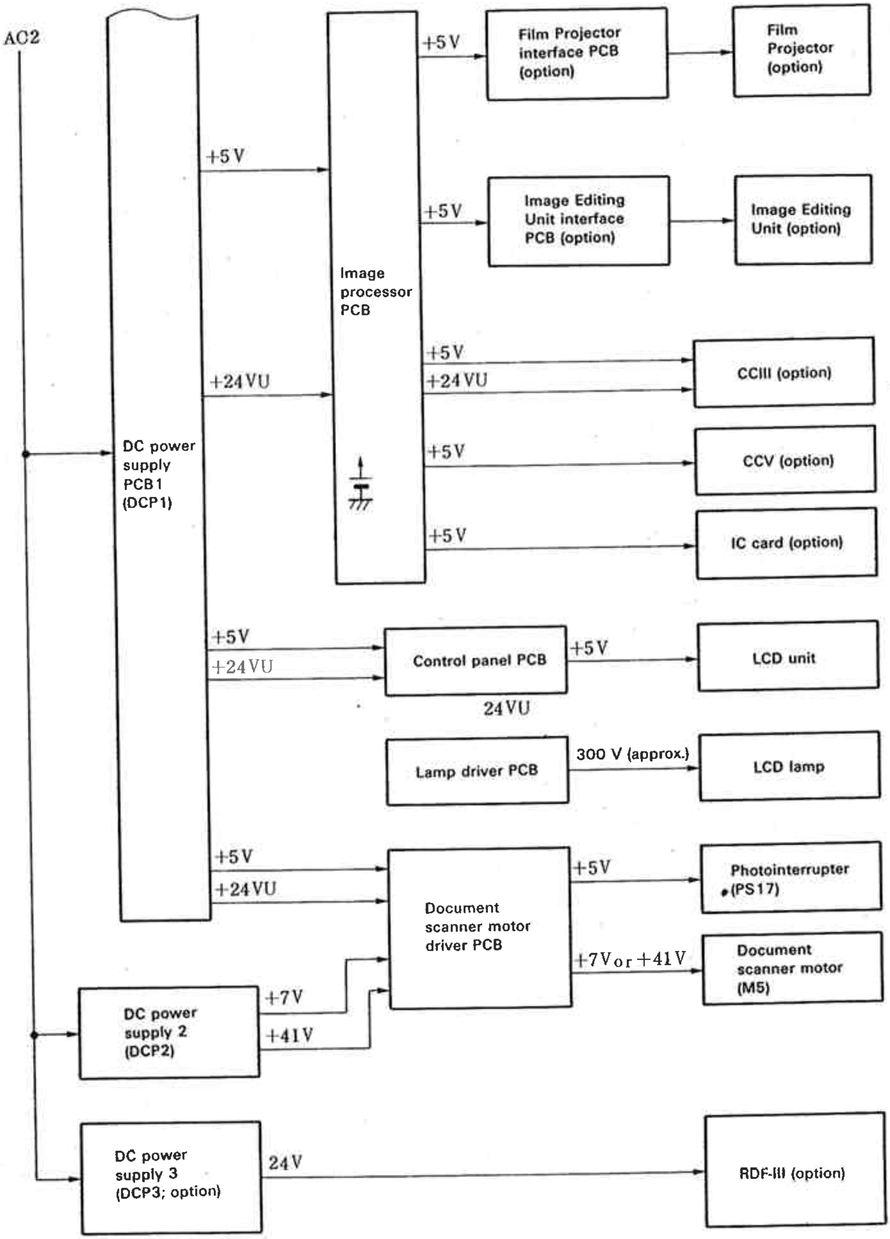

AC2
DC power supply PCB1 (DCP1)
+5 V
+24 VU
Image processor PCB
+5 V
Film Projector interface PCB (option)
Film Projector (option)
+5 V
Image Editing Unit interface PCB (option)
Image Editing Unit (option)
+5 V
+24 VU
CCIII (option)
+5 V
CCV (option)
+5 V
IC card (option)
+5V
+24VU
Control panel PCB
+5 V
LCD unit
24 VU
Lamp driver PCB
300 V (approx.)
LCD lamp
+5 V
+24 VU
Document scanner motor driver PCB
+5 V
Photointerrupter (PS17)
+7 V or +41 V
Document scanner motor (M5)
DC power supply 2 (DCP2)
+7 V
+41 V
DC power supply 3 (DCP3; option)
24 V
RDF-III (option)

Figure 3-1002

XI. SERVICE MODE

A. Outline

Table 3-1100 shows the service modes available.

No.	Ref.	Name
1	DISPLAY	Display mode
2	ADJUST	Adjustment mode
3	FUNCTION	Check mode
4	OPTION	Options mode
5	TEST PRINT*	Test print mode
6	COUNTER	Counter mode

*CLC300/350 only.

Table 3-1100

1. Starting Up the Service Mode and Selecting the Items

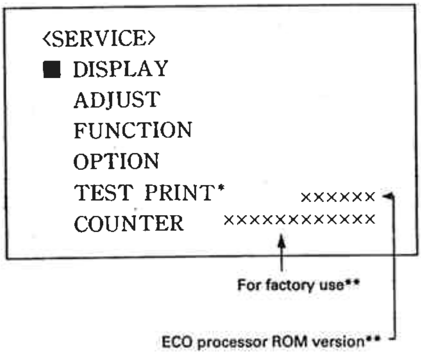
■ The service modes are not available while copy runs are taking place.

1) Press the * key on the control panel
2) Press the ◁ and ▷ keys at the same time.
3) Press the * key.

- The above operation will bring the screen shown in Figure 3-1100 on the display.

4) Press the △ or ▽ key to select the desired item, and press the OK key.

- The above operation will bring the screen of the selected item on the display.



```
<SERVICE>
■ DISPLAY
  ADJUST
  FUNCTION
  OPTION
  TEST PRINT*         xxxxxx
  COUNTER       xxxxxxxxxxxx
```

For factory use**

ECO processor ROM version**

* CLC300/350 only.
** CLC350 only.

Figure 3-1100

2. Clearing the Service Mode

Press the RESET key.

3. RAM Back-Up

Figure 3-1101 shows the label attached behind the left cover of the machine.

Each machine is adjusted at the factory, and the settings are recorded on the label.

Enter the values shown on the label when the image processor PCB has been replaced or the RAM has been cleared. The image processor PCBs available as service parts are programed with default settings; be sure to update the label if new settings have been made in the field.

	DATE							
b01	ODEV - B							
b02	ODEV - G							
b03	ODEV - R							
b04	OFST - B							
b05	OFST - G							
b06	OFST - R							
b07	GAIN - B							
b08	GAIN - G							
b09	GAIN - R							
b10	ADJ - X							
b11	ADJ - Y							
b12	ADJ - S							
b13	REG - X							
b14	REF - Y							
b15	REG - AB							
b16	REG - C							
b17	REGCOLS							
b18	REGCOLP							
b19	TONE - TX							
b20	TONE - PH							
b21	SEG - ADJ							
b22	BC - ADJ							
b23	DA - XS	16						
b24	DA - XE	32						
b25	DA - YS	32						
b26	DA - YE	24						

	DATE							
b27	DS - DOC	18						
b28	DS - PRJ	26						
b29	DS - OHP	22						
b30	REG - ATT							
b31	DVHP - ADJ							
b32	DVCL - TIME							
b33	FUSER - MD	0						
b34	VBACKM							
b35	VBACKC							
b36	VBACKY							
b37	VBACKK							
b38	VCRCTM	0						
b39	VCRCTC	0						
b40	VCRCTY	0						
b41	VCRCTK	0						
b42	SGNL - M							
b43	SGNL - C							
b44	SGNL - G							
b45	SGNL - K							
b46	REF - M							
b47	REF - C							
b48	REF - Y							
b49	REF - K							

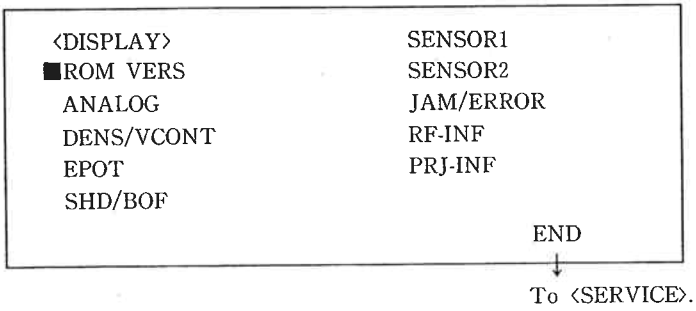
	DATE						
b50	PJRDXS	0					
b51	PJRDXE	0					
b52	PJRDYS	0					
b53	PJRDYE	0					
b54	PJDAXS	0					
b55	PJDAXE	0					
b56	PJDAYS	0					
b57	PJDAYE	0					
b58	EDADJX	0					
b59	EDADJY	0					
b60	RFAJRX	0					
b61	RFAJRY	36					
b62	RFAJDX	0					
b63	SALT - M						
b64	SALT - C						
b65	SALT - A						
b66	SALT - K						
b67	RFAJDY	36					
b68	TRGT - B						
b69	TRGT - G						
b70	TRGT - R						
	BODY NO.						
	T NO.						

FS9 - 8519

Figure 3-1101

Note:
A press on the COPY START key in the service mode will cause the machine to make copies in the mode that was effective immediately before entering the service mode.

B. Display Mode (DISPLAY)



```
<DISPLAY>                 SENSOR1
■ROM VERS                 SENSOR2
 ANALOG                   JAM/ERROR
 DENS/VCONT               RF-INF
 EPOT                     PRJ-INF
 SHD/BOF
                                  END
                                   ↓
                             To <SERVICE>.
```

DISPLAY Screen (CLC300/350 only)

a. Selecting the Item (CLC200)

1) Press the △ or ▽ key to go over the screens from 'DISPLAY1' through 'DISPLAY2'.
2) If the △ key is pressed on screen 'DISPLAY1', or if the ▽ key is pressed on screen 'DISPLAY10', screen 'SERVICE' will be brought back on the display; likewise, if the OK key is pressed on any of the screens, screen 'SERVIcE' will be brougth back on the display.

b. Selecting the Item (CLC300/350)

1) Press the △ or ▽ key to select the item, and press the OK key.
- The screens for the selected items shown on the pages that follow will be brought up.

Note:
The CLC200 and the CLC300/350 have different screen names for DISPLAY.

CLC200	CLC300/350
DISPLAY 1	ROM VERS
DISPLAY 2	ANALOG
DISPLAY 3	DENS/VCONT
DISPLAY 4	EPOT
DISPLAY 5	SHD/BDF
DISPLAY 6	SENSOR1
DISPLAY 7	SENSOR2
DISPLAY 8	JAM/ERROR
DISPLAY 9	RF-INF
DISPLAY 10	PRJ-INF

1. ROM Version/Status

```
 <DISPLAY1>
  VERS-IP =  ×××          STS-SC =  ××
       DC =  ×××              RF =  ××
       SC =  ×××              ED =  ××
       DV =  ×××              PJ =  ××
     LANG =  ×××              MC =  ××
                              ST =  ××
```

CLC200

```
                          To <DISPLAY>.
                               ↑
 <ROM VERS>                ■END
  VERS-IP =  ××.××        STS-RF =  ××
       DC =  ××.××            ED =  ××
       SC =  ××               PJ =  ××
       DV =  ××               MC =  ××
     LANG =  ××               ST =  ××
      IPU =  ××              IPU =  ××
```

CLC300/350

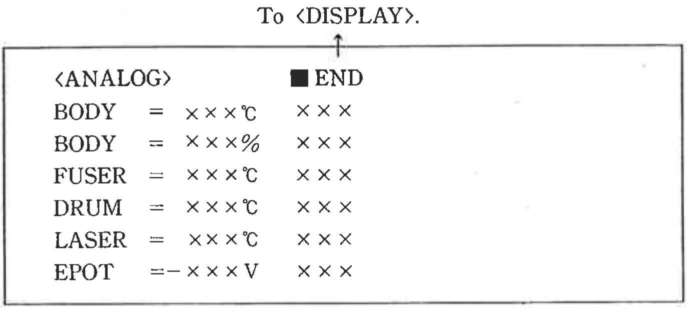
No.	Item	Description	Remarks
	VERS-IP DC SC DV IPU	Shows the ROM version of each PCB. IP: Image processor (Q117, Q130, Q248, Q249) DC: DC controller (Q366, Q381) SC: Scanner motor driver (Q651) DV: Developing assembly shift motor driver (Q686) IPU: IPU; CLC300/350 only	Q130: ROM1 Q117: ROM2 Q248: ROM3 Q249: ROM4
	LANG	Shows the language of the ROM on the image processor PCB; CLC200 LANG = 0: Japanese 1: English (USA) 2: English (UK) 3: English (Europe, Australia) 4: French 6: German 7: Spanish 8: Italian 9: Swedish 10: Norwegian 11: Danish 12: Dutch 13: Finnish 14: Portuguese	

No.	Item	Description	Remarks
	LANG	Shows the language of the ROM on the image processor PCB; CLC300/350. LANG = XX 1: AB 2: inch 3: A 4: AB/inch 1: Japanese 7: Finish 2: English 8: Italian 3: French 9: Norwegian 4: German A: Portuguese 5: Danish B: Spanish 6: Dutch C: Swedish	
	STS-SC	Shows the comprehensive status of the scanner driver PCB and the status of communications errors in the two-digit sexadecimal system; CLC200 only. Error 1 : 02 Error 2 : 04 Error 3 : 08 Forward : 10 In reverse : 20 HP sensor ON : 40 Reception error : 81 MSB error : 82 No command : 84	

No.	Item	Description	Remarks
	STS-RF	Shows the condition of each external device. RF= 0: RDF absent. 1: RDF present.	
	ED	ED= 0: Image editing unit absent; however, I/F PCB present. 1: Image editing unit present. 2, 4: Image editing unit absent; however, memory error present. 3, 5: Image editing unit present; however, memory error present. 6: Image editing unit absent; I/F PCB absent or memory error present. 7: Image editing unit present; I/F PCB absent or memory error present.	
	PJ	PJ= 0: Projector absent; however, I/F PCB present. 1: Projector present. 2: Projector absent; I/F PCB absent or memory error present. 3: Projector present; however, memory error present.	
	MC	MC= 0: IC card unit absent. 1: IC card unit present. 9: IC card present. 11: IC card present; however, unformatted.	
	ST	ST= 0: Offset tray absent. 1: Offset tray present.	
	IPU*	IPU= 0: I/F PCB absent. 1: (only) I/F PCB present. 2: PS-IPU present. 4: IPU present.	

* CLC300/350 only.

2. Analog Sensor

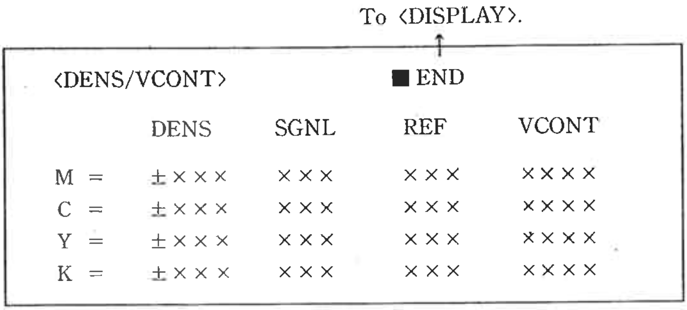


To 〈DISPLAY〉.

```
〈ANALOG〉          ■END
BODY   =  ×××℃    ×××
BODY   =  ×××%    ×××
FUSER  =  ×××℃    ×××
DRUM   =  ×××℃    ×××
LASER  =  ×××℃    ×××
EPOT   =-×××V     ×××
```

No.	Item	Description	Remarks
		Shows measurements taken by each sensor.	××× represents raw data between 0 and 255. ××C and ××% under BODY are computed every 30 min.
	BODY	BODY: Temperature by the environment sensor.	
	BODY	BODY: Humidity by the environment sensor.	
	FUSER	FUSER: Temperature by the fixing assembly thermistor.	
	DRUM	DRUM: Temperature by the drum thermistor.	
	LASE	LASER: Temperature by the laser thermistor.	
	EPOT	EPOT: Potential by the potential sensor.	

3. Concentration of Developer and Contrast Potential



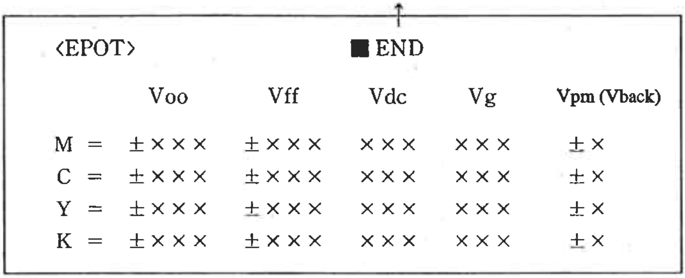
To <DISPLAY>.

```
<DENS/VCONT>                    ■ END

            DENS      SGNL      REF       VCONT

M  =        ±×××      ×××       ×××       ××××
C  =        ±×××      ×××       ×××       ××××
Y  =        ±×××      ×××       ×××       ××××
K  =        ±×××      ×××       ×××       ××××
```

No.	Item	Description	Remarks
	DENS M C Y K	Shows the concentration of the developer inside the developing assembly. +: High against the target value. −: Low against the target value. SGNL and REF stored under 'ATR-INIT' and the value computed based on SGNL and REF under 'DENS/Vcont'.	unit: 0.1%
	SGNL M C Y K	Measurements taken of the concentration of the developer.	Taken for each copy run.
	REF M C Y K	Measurements taken of the reference signal.	Taken for each copy run.
	VCONT M C Y K	Target value of the contrast potential computed based on the measurements taken by the environment sensor.	Value after correction by VCRCT, VTMPR, and Vcont SALT.

4. Control Data for Photosensitive Drum Surface Potential

To 〈DISPLAY〉.



```
〈EPOT〉                              ■END

          Voo      Vff      Vdc    Vg     Vpm (Vback)

M  =   ±×××    ±×××    ×××    ×××      ±×
C  =   ±×××    ±×××    ×××    ×××      ±×
Y  =   ±×××    ±×××    ×××    ×××      ±×
K  =   ±×××    ±×××    ×××    ×××      ±×
```

No.	Item	Description	Remarks
	V_{oo} M C Y K	Target value of V_D (when laser output is oo).	unit: V
	V_{ff} M C Y K	Target value of V_L (when laser output is ff)	unit: V
	V_{dc} M C Y K	Target value of V_{dc} (DC component of developing bias)	unit: V
	V_g M C Y K	Target value of V_g (grid bias)	unit: V
	V_{pm} M C Y K	Difference between the Voo target value and measurements; CLC200 only +: Higher against the target value. −: Lower against the target value (closer to 0).	unit: V
	V_{back} M C Y K	Potential setting for defogging ; CLC300/350 only	−7 to 7

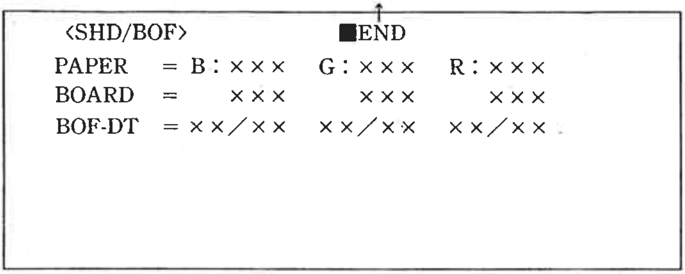
- The measurements taken of V_{oo} and V_{ff} can be checked by 'EPC' under 'FUNCTION'.

5. Black Offset and Shading Data (CLC200)

```
<DISPLAY5>
                 B       G       R
BOF-OD   =     ×××     ×××     ×××
    EV   =     ×××     ×××     ×××
WDT-OD   =     ×××     ×××     ×××
    EV   =     ×××     ×××     ×××
BDT-OD   =     ×××     ×××     ×××
    EV   =     ×××     ×××     ×××
```

No.	Item	Description	Remarks
	BOF-OD B G R	Output of odd bits of each CCD when the scanning lamp is OFF.	Normal if around 8.
	BOF-EV B G R	Output of even bits of each CCD when the scanning lamp is OFF.	Normal if around 8.
	WDT-OD B G R	Output of odd bits of each CCD when the density of the copy paper is measured.	
	WDT-EV B G R	Output of even bits of each CCD when the density of the copy paper is measured.	
	BDT-OD B G R	Output of odd bits of each CCD when the density of the standard white plate is measured.	Check that WDT > BDT for each color.
	BDT-EV B G R	Output of even bits of each CCD when the standard white plate is measured.	Check that WDT > BDT for each color.

5a. Black Offset and Shading Data (CLC300/350)



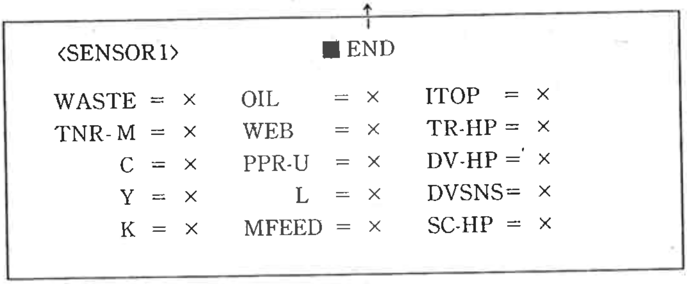
To <DISPLAY>.

```
  <SHD/BOF>                  ■END
 PAPER   = B : ×××   G : ×××   R : ×××
 BOARD   =     ×××       ×××       ×××
 BOF-DT  = ××/××     ××/××     ××/××
```

No.	Item	Description	Remarks
	PAPER B G R	Output of each CCD when measuring the density of the copy paper.	Check that PAPER>BOARD for each color.
	BOARD B G R	Output of each CCD when measuring the density of the standard white plate. • Stored at time of WSMP.	
	BOF-DT B G R	Output of each CCD when the scanning lamp is OFF (odd/even bits).	

6. Sensor 1

To <DISPLAY>.



```
<SENSOR1>                  ■END

WASTE  = ×    OIL    = ×    ITOP   = ×
TNR-M  = ×    WEB    = ×    TR-HP  = ×
    C  = ×    PPR-U  = ×    DV-HP  = ×
    Y  = ×        L  = ×    DVSNS= ×
    K  = ×    MFEED  = ×    SC-HP  = ×
```

No.	Item	Description	Remarks
		Shows the output of each sensor.	
	WASTE	Waste toner sensor	'1', if specified value or more.
	TNR-M	M toner level sensor (inside hopper)	'0', if less than specified value.
	C	C toner level sensor (inside hopper)	'0', if less than specified value.
	Y	Y toner level sensor (inside hopper)	'0', if less than specified value.
	K	Bk toner level sensor (inside hopper)	'0', if less than specified value.
	OIL	Oil level sensor (PS7)	'0', if less than specified value.
	WEB	Belt length sensor (PS8)	'1', if less than specified value.
	PPR-U	Upper cassette paper sensor (PS15)	'1', if paper is present.
	L	Lower cassette paper sensor (PS16)	'1', if paper is present.
	MFEED	Manual feed mode sensor (PS14)	'1', if in manual feed mode.
	ITOP	Image leading edge sensor (PS3)	'1', if blocked by light blocking plate.
	TR-HP	A-side sensor (PS4)	'1', if blocked by light blocking plate.
	DV-HP	Developing assembly base HP sensor (PS5)	'1', if blocked by light blocking plate.
	DVSNS	Development position sensor (PS6)	'1', if blocked by light blocking plate.
	SC-HP	Scanner HP sensor (PS17)	'1', if blocked by light blocking plate.

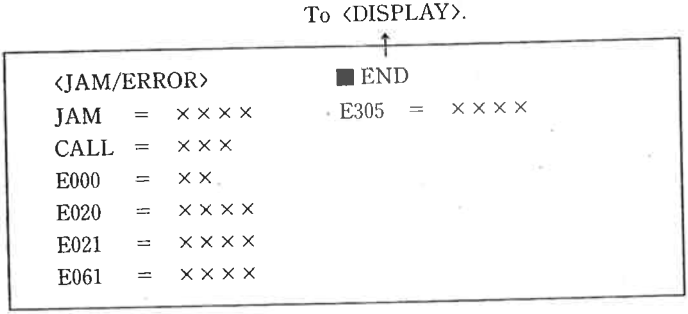
7. Sensor 2

To <DISPLAY>.
↑

```
<SENSOR2>              ■ END
RGST     =  ×          LIFTU  =  ×
ATRCT    =  ×              L  =  ×
TRNS     =  ×          P-LNG  =  ×
TRCLN    =  ×          SIZEU  =  ××××
SPRT     =  ×              L  =  ××××
EXIT     =  ×
```

No.	Item	Description	Remarks
		Shows the output of each sensor.	
	RGST	OHP sensor (pre-registration)	'1', if paper is present.
	ATRCT	Attraction jam sensor (PS18)	'0', if paper is present.
	TRNS	Transfer jam sensor (PS19)	'0', if paper is present.
	TRCLN	Transfer drum pre-cleaning sensor (PS20)	'0', if paper is present.
	SPRT	Separation sensor (PS10)	'1', if paper is present.
	EXIT	Delivery sensor (PS9)	'1', if paper is present.
	LIFT U	Upper cassette lifter limit sensor (PS11)	If '1', lifter is up.
	L	Lower cassette lifter limit sensor (PS12)	If '1', lifter is up.
	P-LNG	Manual feed paper sensor (PS13)	'1', if paper is present.
	SIZE U	Upper cassette size switch (SW6)	'0', if pressed.
	L	Lower cassette size switch (SW7)	'0', if pressed.

8. Jam and E Notations



To 〈DISPLAY〉.

```
〈JAM/ERROR〉              ■ END
JAM    =  ××××           E305  =  ××××
CALL   =  ×××
E000   =  ××
E020   =  ××××
E021   =  ××××
E061   =  ××××
```

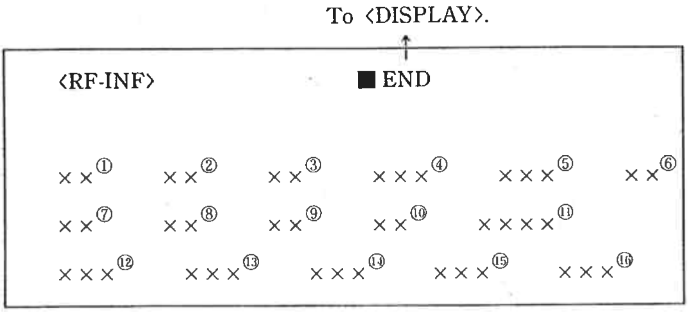
No.	Item	Description
	JAM	Describes the jam in question; see Table 3-1101. ● The description of the most recent jam remains after a re-set by opening and closing the front door.
	CALL E000 E020 E021 E061 E305	Describes the results of the self diagnosis (E notation); see Table 3-1200. ● The description of the most recent E notation remains after a re-set by turning the POWER switch OFF and ON. ● Details are shown if E000, E020, E021, E061, or E305.

Code	Description	Code	Description
0001	Delay; OHP sensor (pre-registration sensor)	0100	Stationary; OHP sensor (pre-registration sensor)
0002	Delay; attraction jam sensor (PS18)	0200	Stationary; attraction jam sensor (PS18)
0004	Delay; transfer jam sensor (PS19)	0400	Stationary; transfer jam sensor (PS19)
0008	Delay; transfer drum pre-cleaning sensor (PS20)	0800	Stationary; transfer drum pre-cleaning sensor (PS20)
0010	Delay; separation sensor (PS10)	1000	Stationary; separation sensor (PS10)
0020	Delay; delivery sensor (PS9)	2000	Stationary; delivery sensor (PS9)
0040	Delay; upper cassette paper sensor (PS15; manual feed mode)		

If two or more jams are identified at power-on, hexadecimal units are used; e.g., OEOO means identification of 0200, 0400, and 0800 at the same time.

Table 3-1101

9. RDF-III



No.	Item	Description
	RF-INF*	Shows communications data from the RDF-III.
	①	Status 1: Shows the following in the two-digit hexadecimal system. Document detected on RDF tray : 01 Document cycle completed : 02 RDF in operation : 04 Standby : 08 Pick-up completed : 10 Size identified : 20 DF in operation : 40
	②	Status 2: Shows the following in the two-digit hexadecimal system. Cover open : 01 RDF open : 02 Document detected on DF tray : 04 Tray open : 08 Alarm ON : 10 Jam present : 20 Error present : 40 Down : 80
	③	Shows the size of the document in the form of codes; see Table 3-1102.
	④	Shows the length of the document in mm; hexadecimal. EX: 1A4 → 420 mm.
	⑤	Shows the width of the document in mm; hexadecimal. EX: 129 → 297 mm.
	⑥	Shows the number of documents; hexadecimal.
	⑦	Shows down information; see Table 3-1103.
	⑧	Shows jam information; see Tables 3-1104 and 1105.
	⑨	Shows alarm information; see Table 3-1106.

No.	Item	Description
	⑩	Shows sensor information; shows the problem sensor in the two-digit hexadecimal system. Document sensor : 01 Tray guide sensor : 02 Pick-up sensor : 04 Skew sensor : 08 Reversal sensor : 10
	⑪	Reserved.
	⑫	Shows the output level of the document sensor; hexadecimal.
	⑬	Shows the output level of the tray guide sensor; hexadecimal.
	⑭	Shows the output level of the pick-up sensor; hexadecimal.
	⑮	Shows the output level of the skew sensor; hexadecimal.
	⑯	Shows the output level of the reversal sensor; hexadecimal.

Code	Document size
01	B5
02	Foolscap
03	A4
04	B5R
05	B4
06	A4R
07	A3
09	Mini-H
0B	Letter
0D	Legal
0E	Letter R
0F	Ledger
11	A5
17	Computer
IC	Statement

Table 3-1102 Document Size

Code	Description
01	E401 ON signal
02	E402 ON signal
03	E403 ON signal
04	E404 ON signal
11	E411 ON signal

Table 3-1103 Down Information

Code	Jam
01	The document has been pulled out during its pick-up.
02	Delay; pick-up sensor.
03	Delay; registration/skew sensor.
04	Skew, leading edge; registration/skew sensor.
05	Stationary; registration/skew sensor.
06	Double feeding; registration/skew sensor.
07	Skew, trailing edge; registration/skew sensor.
09	Bend, leading edge; registration/skew sensor.
11	Delay 1; reversal sensor.
12	Stationary; reversal sensor.
13	Delay 2; reversal sensor.
20	Stationary, initial; reversal sensor.
21	Delay; registration/skew sensor.
22	Skew, leading edge; registration/skew sensor.
23	Stationary, reversal/pick-up; registration/skew sensor.
24	Skew, trailing edge, reversal; registration/skew sensor.

Table 3-1104 Jam Information 1

Code	Jam
26	Bend, leading edge, pick-up; registration/skew sensor.
41	Delay; delivery sensor.
42	Stationary; delivery sensor.
81	Open; door/cover.
82	Open; pick-up tray/upper cover.
83	The document sensor has not detected the document to be delivered.
84	The sensor has detected a document during a pick-up.
85	A jam peculiar to the test mode has occurred.
86	The tray guide width is smaller than the document to be delivered during delivery.
87	Double feeding of documents has been detected when the detection mechanism is activated.
88	A document remaining from the preceding cycle has been detected when the first document of a new cycle was picked up.
89	The recycle bar has failed while the document was being cycled (2nd cycle and thereafter).

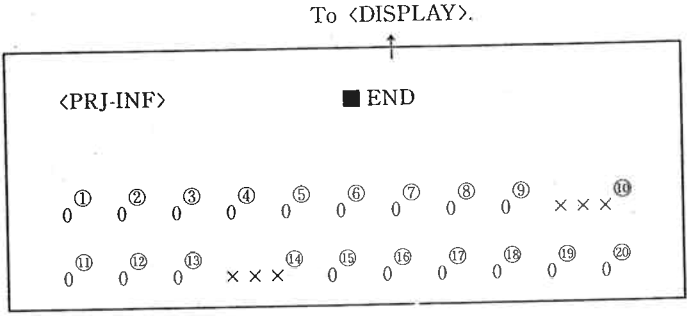
Table 3-1105 Jam Information 2

Code	Description
01	The recycle bar has made an idle movement.
02	The document end sensor has not detected a document.
03	Separation has failed during a pick-up.
04	The document has moved askew during a pick-up.
05	The document has overridden the paper stopper during a pick-up.
11	The number of documents has changed after jam removal.
12	An excessive number of documents is used.

If documents are not set properly, the fact will be communicated to the copying machine in the form of any of the above codes.

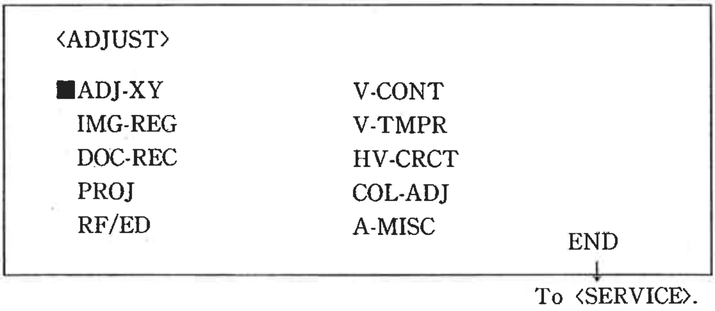
Table 3-1106 Alarm Information

10. Film Projector



No.	Item	Description	Remarks
	PRJ-INF	Shows the communications data from the film projector.	
	①	If the auto changer is present or absent.	'1', if present.
	②	If the slide tray is present or absent.	'1', if present.
	③	Type of tray.	'1', if of 140; '2', if of 80.
	④	If a slide is set or not.	'1', if set.
	⑤	Reserved.	
	⑥	If tray is moving.	'1', if moving.
	⑦	If tray movement mechanism is normal or abnormal.	'1', if abnormal.
	⑧	If a tray home position error has occurred or not.	'1', if inerror.
	⑨	If the tray is making a local movement.	'1', if moving.
	⑩	Position of the tray.	
	⑪	Reserved.	
	⑫	If the lens is moving or not.	'1', if moving.
	⑬	If the motor is ON or OFF.	'1', if ON.
	⑭	Position of the lens.	
	⑮	Reserved.	
	⑯	If the lamp has continuity.	'1', if broken.
	⑰	Reserved.	
	⑱	Initialization.	'1', if being initialized.
	⑲	Local movement.	'1', if moving.
	⑳	Remote/Local	'0', if remote. '1', If local.

C. Adjustment Mode (ADJUST)



```
<ADJUST>

■ADJ-XY          V-CONT
 IMG-REG         V-TMPR
 DOC-REC         HV-CRCT
 PROJ            COL-ADJ
 RF/ED           A-MISC
                                END
```

To <SERVICE>.

ADJUSTMENT Screen

a. Selecting the Item
1) Press the ∇ or △ key to select the item, and press the OK key.
- The screens for the selected items shown on the pages that follow will be brought up on the display.

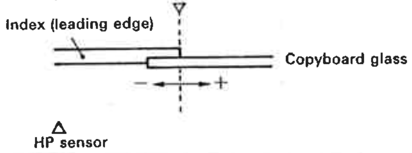
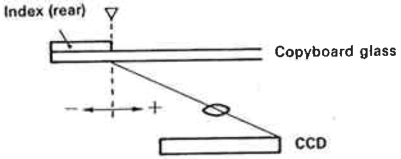
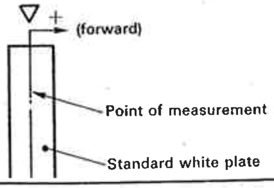
b. Key Operations
1) Press the ∇ or △ key to select the item.
2) Press the ◁ or ▷ key to change the setting.
3) Press the OK key to register the setting.

> **Note:**
> Be sure to record the new setting, if made, on the label behind the left cover; see Figure 3-1101.

4) Press the C/⊛ key and OK key to return it to the default setting.

1. Adjusting the Image Read Start Position

```
<ADJ-XY>

ADJ-X  =  ±××
    Y  =  ±××
    S  =   ××


                                   END
                                    ↓
                                 To  ADJUST>.
```

No.	Item	Description	Setting
	ADJ-X	Make adjustments so that the image read start position matches the index on the copyboard glass. In fine-adjusting the distance between the scanner HP sensor and read start position, note the following: • Unit: number of steps of the stepping motor. • Make adjustments as shown on the next page.  Index (leading edge) Copyboard glass − + HP sensor	−36 to +36 (−3.9 to +3.9 mm) unit: 0.107 mm (approx.)
	ADJ-Y	In adjusting the CCD read start position, note the following: • unit: pixel • Make adjustments as shown next page.  Index (rear) Copyboard glass − + CCD	−40 to +40 (−2.5 to +2.5 mm) unit: 0.06 mm (approx.)
	ADJ-S	Use it to fine-adjust the point at which measurements are taken for shading correction (standard white plate); CLC300/350 only. • unit: number of steps of stepping motor. • Dirt or scratches on the standard white plate can cause vertical white lines on copies; shift the point of measurement using ADJ-S if this is the case.  + (forward) Point of measurement Standard white plate	0 to 45 (0 to 4.8 mm) unit: 0.107 mm (approx.)

Adjusting the Image Read Start Position

Check the point of attraction before making the following adjustments.

1) Bring up screen 'ADJ-XY', and press the COPY START key.
- The copy mode will be set automatically, and a copy is made with a shift of about 50 mm as shown in Figure 3-1102.
2) Decrease the setting under 'ADJ-X, ADJ-Y' if the image has a missing section.
3) Increase the setting under 'ADJ-X, ADJ-Y' if sections outside the image is copied.

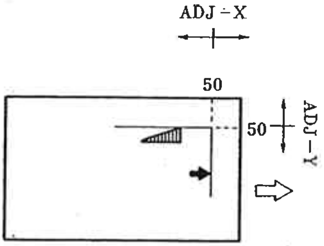


Figure 3-1102

2. Adjusting the Registration Between Copy Paper and Image

```
<IMG-REG>

REG-X    =  ±××          REGCOLs = ±××
    Y    =  ±××             COLp = ±××
    AB   =  ±××
    C    =  ±××
MSR-AB   =   0                          END
                                         ↓
                                    To <ADJUST>.
```

No.	Item	Description	Setting
	REG-X	Adjusting the Leading Edge Registration Fine-adjust the image leading edge signal (reference signal generated by the transfer drum) and the timing at which the scanner starts. • unit: line • Make adjustments as shown on the next page.	–99 to +99 (–6.3 to +6.3 mm) unit: 0.06 mm (approx.)
	REG-Y	Adjusting the Left/Right Registration Fine-adjust the BD signal and video signal. • unit: pixel • Make adjustments as shown on the next page.	–99 to +99 (–6.3 to +6.3 mm) unit: 0.06 mm (approx.)
	REG-AB	Displaying the Difference in Frequency Between the A-Side and B-Side Image Leading Edge Signals • unit: line • Do not change the measurements taken automatically.	–99 to +99 (–6.3 to +6.3 mm) unit: 0.06 mm (approx.)
	REG-C	Adjusting the Leading Edge Registration for C-Side Copying (OHP pick-up and film projector) • unit: line • Make a copy on OHP manually, and make adjustments as shown on the following page. (In the case of the CLC350, use plain paper.)	–99 to +99 (–6.3 to +6.3 mm) unit: 0.06 mm (approx.)
	MSR-AB	Measuring the Difference in Frequency Between the A-Side and B-Side Leading Edge Signals Automatically The measurements are used to control registration of the B-side leading edge and two-sheet attraction (retention); they are displayed under REG-AB.	▷ : 0 → 1 OK: execute.
	REGCOLs REGCOLp (See Note.)	Adjusting Color Displacement (1st color); CLC300/350 only Make adjustments when the first color is displaced in the sub scanning (feeding) direction. Make a single copy each of the four colors, and set the average of the displacements. • If M has a "delay" compared to other colors, '+'; otherwise, '–'. • Be sure to make these adjustments after checking for excessive loads and checking the transfer drum. REGCOLs: shift the start timing of the scanner. REGCOLp: shift the output timing of the laser (sub scanning direction).	REGCOLs –63 to +63 (–0.82 to +0.82 mm) Unit: 0.013 mm (approx.) REGCOLp –2 to +2 (–0.12 to +0.12 mm) Unit: 0.06 mm (approx.)

Note:
To correct color displacement for normal copying operation, use REGCOLs. If the displacement occurs only when copying is from images on the IPU or of the test print, adjust REGCOLp.

Adjusting Copy Paper and Image Registration

Be sure to perform 'Adjusting the Image Read Start Position Adjustment (ADJ-XY)' before making the following adjustments.

1) Bring up screen 'IMG-REG', and press the COPY START key.
- A copy will be made with a shift of 50 mm as shown in Figure 3-1103.

2) Measure the distance between the image end and copy paper end.
3) Decrease the setting of REG-X, REG-Y, or REG-C if the shift is 50 mm or more.
4) Increase the setting of REG-X, REG-Y, or REG-C if the shift is less than 50 mm.

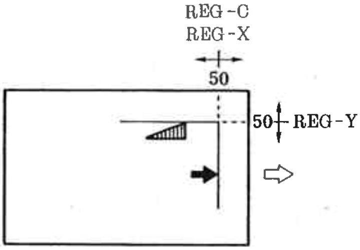
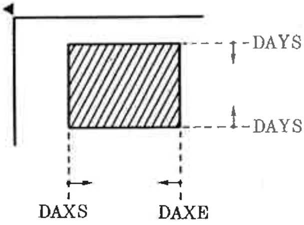


Figure 3-1103

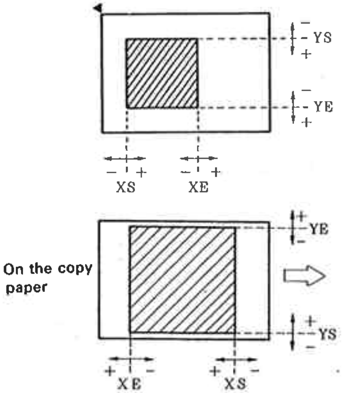
3. Adjusting the Document Detection Area and Slice Level

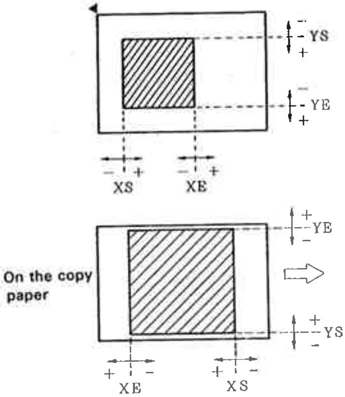
```
<DOC-REC>

DA-XS  =  ××          DS-DOC  =  ××
   XE  =  ××             PRJ  =  ××
   YS  =  ××             OHP  =  ××
   YE  =  ××

                                  END
                                   ↓
                            To <ADJUST>.
```

No.	Item	Description	Setting
	DA-XS XE YS YE	Fine-Adjusting the Document Detection Area If the document is not placed in parallel with the inde on the copy-board glass in the document detection mode, the frame of its copy may show a black strip; set the width of the non-image area in the mode to prevent such a problem.  Changing the values changes the width (frame erasing) when the projector is used in the document identification mode.	0 to 99 (0 to 6.3 mm) standard: XS = 24 XE = 8 YS = 32 YE = 24 unit: 0.06 mm (approx.)
	DS-DOC PRJ OHP	Adjusting the Slice Level for Document Detection Use the mode to set the slice level as desired; although an increase in the slice level enhances the detection capability, it can also lead to wrong detection. Select it if normal documents are used. Select it if the area projected by the film projector is to be checked. Select it if film (6×6, 8×10, etc.) placed on the copy-board glass is to be checked in relation to the reference sheet.	0 to 31 (density level of 0 to 248) standard: DS-DOC = 18 PRJ = 28 OHP = 22

4. Adjusting the Read Area (film projector)

```
<PROJ>

PJRDXS  =  ±×××     PJDAXS  =  ±××
    XE  =  ±×××         XE  =  ±××
    YS  =  ±×××         YS  =  ±××
    YE  =  ±×××         YE  =  ±××

                                  END
                                   ↓
                              To <ADJUST>
```

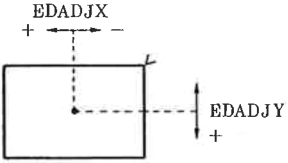
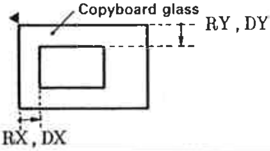
No.	Item	Description	Setting
	PJRD-XS XE YS YE	Fine-Adjusting the Read Area (film projector in use, document detection OFF; or document identification fails despite ON)  YS YE XS XE On the copy paper YE YS XE XS	– 300 to +300 (– 19.0 to +19.0 mm) unit: 0.06 mm (approx.); reference is to the copyboard glass. standard: 0

No.	Item	Description	Setting
	PJDA-XS XE YS YE	Fine-Adjusting the Area to be Detected (film projector in use, document detection ON) • It may be used for read area in the copyboard mode with the document detection mechanism OFF. • If at the standard value, i.e., '0', the area is within 5 mm toward the center of the Fresnel lens.  YS YE XS XE On the copy paper YE YS XE XS • This adjustment applies to the area of the copyboard glass used for document detection, NOT to the area that has been detected. • To erase the black frames around copied images or to decrease the size of such frames, adjust DA-XS through-YE under DOC-REC not PJDA.	-99 to +99 YS, YE (-6.3 to +6.3 mm) unit: 0.06 mm (approx.) XS, XE (-10.9 to 10.9 mm) unit: 0.11 mm (approx.) Reference is to the copyboard glass. standard: 0

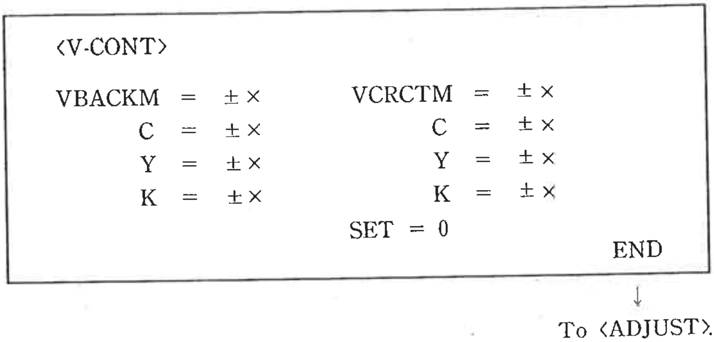
5. Adjusting the RDF and Image Editing Unit

```
 <RF/ED>
EDADJX  =  ±××    ××××    ×××   mm
     Y  =  ±××    ××××    ×××   mm
RFAJRX  =  ×××
    RY  =  ×××
    DX  =  ×××
    DY  =  ×××                       END
```

↓ To <ADJUST>.

No.	Item	Description	Setting
	EDADJ-X Y	Adjusting the Input Coordinates on the Image Editing Unit  **Note:** $\text{EDADJX}=\underbrace{\pm\times\times}_{\text{Setting (adjustment)}}\ \underbrace{\times\times\times\times}_{\text{Read data}}\ \underbrace{\times\times\times\text{mm}}_{\text{Read coordinate (mm)}}$	−99 to +99 (−12.6 to +12.6 mm) unit: 0.13 mm (approx.) standard: 0
	RFAJ-RX RY DX DY	Document Set Index (RDF in use) If a document picked up by an RDF, if attached, has not been set at the index of the copyboard glass (same discrepancy for each copy run), the document read position can be adjusted by the copying machine to correct the discrepancy. RX, RY: RDF document tray DX, DY: DF document tray 	0 to 99 (0 to 6.3 mm) unit: 0.06 mm (approx.) standard: RX, DX = 0, RY, DY = 36 (2.3 mm)

6. Adjusting the Photosensitive Drum Potential Contrast



```
<V-CONT>

VBACKM  =  ±×        VCRCTM  =  ±×
     C  =  ±×             C  =  ±×
     Y  =  ±×             Y  =  ±×
     K  =  ±×             K  =  ±×
                     SET  =  0
                                   END
                                    ↓
                              To <ADJUST>.
```

Figure 3-1116

No.	Item	Description	Setting
	VBACKM C Y K	Adjusting the Potential (Vback) to Eliminate Fogging; CLC200 only • Not applicable to servicing in the field.	– 7 to 7 standard: 0
	VCRCTM C Y K	Fine-Adjusting the Contrast Target Potential • Effective only for auto contrast (VCONT = 0). • Make adjustments according to the BASIC IMAGE ADJUSTMENT PROCEDURE.	– 4 to 4 standard: 0 +: darker –: lighter
	SET	Execution of SET after modifying the value changes the image.	

$$\mathrm{Vcont} + \mathrm{Vcrct} + \mathrm{Vtmpr} + \mathrm{VcontSALT} = (V_D - V_L) - \mathrm{Vback}$$

■ Adjusting VCRCT-K

1. Check that the setting of DENS-K under DISPLAY3 or DENS/VCONT is within ±5 before adjusting VCRCT-K; if not, make 20 test prints in the 'Bk mono, AR/LTR, PGTYPE = 10' (horizontal stripe), and check if it is now within ±5. If this fails, do not adjust VCRCT-K, and check the black toner concentration sensor and photosensitive drum or replace the black developer.
2. After deciding on a setting for VCRCT-K, read in INIT= K2 and =K3 according to 'ART-INIT' of 'FUNCTION'.

7. Adjusting the Contrast Target Potential (Installation/Developer Replacement)

```
<V-TMPR>

VTMPRM  =  ±××  (±××)
      C =  ±××  (±××)
      Y =  ±××  (±××)
      K =  ±××  (±××)
START   =  0
                                END
```

No.	Item	Description	Setting
	VTMPRM C Y K	Adjusting the Contrast Target Potential to Be Used at Time of Installation and Developer Replacement • Execution of START after modifying the value changes the image. The value returns to '0' 8 hrs. after execution of START; the value at the time can be checked by '(±××)'. • Make adjustments according to the BASIC IMAGE ADJUSTMENT PROCEDURE.	– 18 to + 18 standard = 0 +: darker –: lighter
	START	Transferring the Value of VTMPR to the DC Controller and Starting Adjustment for a 8 Hour Period	▷ : 0 → 1 OK: execute.

8. Adjusting the High-Voltage Output

```
<HV-CRCT>

TRNS-T   =  ×              ATTRCT-A  =  ±×
     A   =  ±×                    B  =  ±×
     B   =  ±×             PRECLN -A =  ×
ELMN-A   =  ±×                    B  =  ±×
A-PARA   =  ××××            SET = 0
                                         END
                                          ↓
                                    To <ADJUST>
```

For details of adjustment, see page 3-215 after modification of the value, execute SET and check the image.

No.	Item	Description	Setting
	TRNS-T	Adjusting the OFF Timing for the Transfer High Voltage • A higher setting will advance the OFF timing.	0 to 6 standard = 2
	TRNS-A B	Adjusting the Transfer High-Voltage Output • A higher setting will increase the output. • For better results, adjust TRANS-A if the humidity is low (A-PARA at 580 or less), or adjust TRANS-B if high (A-PARA at 580 or more). • 'TRNS-B' may be set to as low as '–7'; however, a setting it to '–4' or lower will result in an output of '–4'.	A:–7 to +7 B: –4 to +7 standard: 0
	ELMN-A	Switching the OFF Conditions for the Internal/External Static Eliminator and Separation in a High Humidity Environment • A higher setting will lower the slice level.	–3 to +3 standard: 0
	A-PARA	Environment Data • This refers to the data computed based on the temperature and humidity measurements put out by the environment sensor.	
	ATTRCT-A B	Adjusting the Attraction High-Voltage Output • A higher setting will increase the output. • For better results, adjust ATTRCT-A if the humidity is low or adjust ATTRCK-B if high. • 'ATTRCT-B' may be set between '–7'; and '+7'; however, setting it to '–5' or lower or '+5' or higher will result in an output of '–5' or '+5' respectively.	A: –7 to +7 B: –5 to +5 standard: 0
	PRECLN-A B	Adjusting the Pre-Cleaning High-Voltage Output • A higher setting will increase the output. • For better results, adjust PRECLN-A if the humidity is low (A-PARA at 1050 or less), or adjust PRECLN-B if high (A-PARA at 1050 or more).	A: 0 to 4 B: –2 to +2 standard = 0
	SET	Transferring the DATA on the Screen to the DC Controller	

9. Correcting the User Color Balance Adjustment

```
<COL-ADJ>

ADJ-M  =  ±×                 OFST-M = ××
    C  =  ±×                      C = ××
    Y  =  ±×                      Y = ××
    K  =  ±×                      K = ××

                                        END
```

No.	Item	Description	Setting
	ADJ-M C Y K	Correcting the User Color Balance Adjustment • Return the user color balance mode to '0' before using this mode. • Make adjustments according to the BASIC IMAGE ADJUSTMENT PROCEDURE.	−8 to +8 standard: 0 +: darker −: lighter
	OFST-M C Y K	Adjust the density of the light area and color balance (CLC350 only). • Perform the Image Adjustment Basic Procedure. • If fogging is noted, increase the setting. • To improve reproducibility when the density is considerably low, decrease the setting.	0 to 16 standard: M=5 C=5 Y=10 K=5

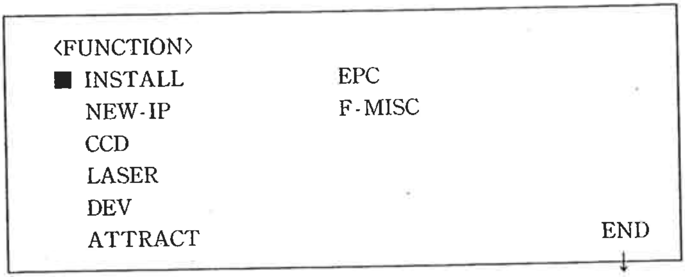
10. Other Adjustments

```
<A-MISC>
VCONT    =  ×            TONE-TX  =  ±××
ENV      =  ×                 PH  =  ±××
WEB      =  ××           SEG-ADJ  =  ±×
SET      =  ×            BC-ADJ   =  ±×

                                     END
                                      ↓
                                 To <ADJUST>.
```

No.	Item	Description	Setting
	VCONT	Switching Between Auto and Manual for the Target Contrast Potential Settings (V_G, V_{DC}) 0: auto (setting by data from the environment sensor) 1 to 8: manual 1: 150 V 2: 200 V 3: 250 V 4: 300 V 5: 350 V 6: 400 V 7: 450 V 8: Reserved.	0 to 8 • 1 to 8 are used for checks only; normally, keep it 0. • Execute SET first; then, check.
	ENV	Switching Between Auto and Manual for the Transfer, Attraction, and Static Eliminator Corona Unit Output ; CLC200 only 0: auto (setting by data from the environment sensor) 1 to 4: manual 1: larger output 2: ↓ 3: 4: smaller output 5: Reserved.	0 to 5 • 1 to 5 are used for checks only; normally, keep it 0. Execute SET first; then, check.
	WEB	Setting the Feed Length of the Cleaning Belt • If it is set to 10, the solenoid goes ON once for each 10 S-size copies and for each 5 L-size copies.	1 to 15 unit: copy standard: 15 • Execute SET first; then, check.
	SET	• Transferring the Values of VCONT, ENV, and WEB to the DC Controller.	▷: 0 → 1 OK: execute.

No.	Item	Description	Setting
	TONE-TX PH	Correcting the Copy Density; CLC200 only This mode is used to set the value used by the image processing unit to correct copy density; this is the same as 'TONE-TX, PH' of 'FUNCTION', and adjustments should be made on screen LASER. +: darker −: lighter TX: when in text mode PH: when in photo mode	− 19 to + 19 standard: 0
	SEG-ADJ	Fine-Adjusting the Separation Level of Text and Photos in the Text/Photo Mode +: tends to identify the image as photos. −: tends to identify the image as text. ● The mode is used to correct a user options mode, 'Text/Photo Level'.	− 2 to + 2 standard: 0
	BC-ADJ	Correcting Black Text A higher setting will make black text darker than they are when copied in 4-color text/photo mode.	− 4 to + 4 standard: 0

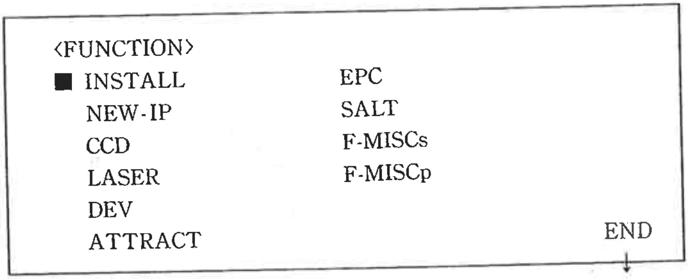
D. Check Mode (FUNCTION)



```
<FUNCTION>
■ INSTALL            EPC
  NEW-IP             F-MISC
  CCD
  LASER
  DEV
  ATTRACT                              END
```

To <SERVICE>.

CLC200



```
<FUNCTION>
■ INSTALL            EPC
  NEW-IP             SALT
  CCD                F-MISCs
  LASER              F-MISCp
  DEV
  ATTRACT                              END
```

To <SERVICE>.

CLC300/350

FUNCTION Screen

a. Selecting the Item

1) Press the ▽ or △ key to select the item, and press the OK key.

- The screens for the selected items shown on the pages that follow will be brought up.

b. Key Operations

1) Press the ▽ or △ key to select the item.
2) Operate as described on each screen.

1. Installation Mode

```
<INSTALL>
TONER-SPLY      =   0
ATR-VR
ATR-INIT
TONER-INIT      =   0
TONER-RECV
OIL-CHECK       =   0    (OIL-SPLY = 0)        END
                                                ↓
                                        To <FUNCTION>.
```

No.	Item	Description	Key operation
	TONER-SPLY	Select it when supplying the developing assembly with developer. • The screw and cylinder inside the developing assembly will rotate clockwise, and the developing assembly will move and become engaged; supply the developer after the move/engage operation is over. • Do not touch the developing assembly; high-voltage is present. • The developing assembly will be moving; take care.	▷ : 0, M, C, Y, and K in sequence. OK: execute. C/ : end.
	ATR-VR	Press the OK key to move to screen ATR-VR' (VR adjustment).	
	ATR-INIT	Press the OK key to move to screen 'ATR-INIT' (initial setting).	
	TONER-INIT	Feeding the Toner to the Hopper Outlet at Time of Installation • The operation stops automatically after feeding over a specific distance.	▷: 0 → M → C → Y → K → 4C OK: execute.
	TONER-RECV	Press the OK key to move to screen 'TONER-RECV' (developer collection). **Note:** This mode is NOT for installation.	
	OIL-SPLY	Select it to supply the oil pan of the fixing assembly with oil from the bottle; CLC200 only. **Note:** This mode is NOT for installation.	▷ : 0 → 1 OK: execute. Ends automatically after a 5-min supply operation.
	OIL-CHECK	Use it to make sure that the oil felt is sufficiently impregnated with oil; CLC300/350 only. • The copy paper is fed and then stops with the felt forced down against the fixing roller. The condition is normal if, after delivery, traces of oil are noted evenly over the copy paper.	▷: 0 → 1 START: execute.

2. Adjusting the Toner Concentration VR

```
<ATR-VR>
STIR =  0
SGNL-M  =  ×××          REF-M  =  ×××
     C  =  ×××              C  =  ×××
     Y  =  ×××              Y  =  ×××
     K  =  ×××              K  =  ×××
                                        END
                                         ↓
                                  To <INSTALL>.
```

No.	Item	Description	Key operation
	STIR	Select it to stir the developer inside the developing assembly. 3C: 3-color (MCY) 4C: 4-color (MCYK) • The developing assembly will move and become engaged; the cylinder is given a high-voltage.	▷ : 0, M, C, Y, K, 3C, and 4C in sequence. OK: execute. Ends automatically.
	SGNL-M C Y K REF- M C Y K	Select it to adjust the VR on the toner concentration adjusting PCB. SGNL-M: VR904 REF-M: -C: VR905 -C: -Y: VR906 -Y: -K: VR981 -K: VR982 Sound: if absent, clockwise; if at short intervals, counterclockwise; if continuous, end; • In the case of the CLC200, end if 204 ±3. • In the case of the CLC300/350, end if SGNL-K is 128 ±3 and others are 204 ±3. • REF-M, -C, and -Y may be left un-adjusted. • Check that the four connectors in front of the developing assembly are connected properly.	▽ △: select. OK: execute (VR adjustment). C/▽: end.

3. Reading the Toner Concentration Initial Setting

```
<ATR-INIT>
INIT =  0
SGNL-M =  ×××          REF-M =  ×××
     C =  ×××              C =  ×××
     Y =  ×××              Y =  ×××
     K =  ×××              K =  ×××
                                     END
```

↓

To <INSTALL>.

No.	Item	Description	Key operation
	INIT	Select it to read the initial setting of the toner concentration signal (SGNL, REF). • Check that the four connectors in front of the developing assembly are connected properly. • Replace the developer, and execute ATR-VR and ATR-INIT; thereafter, make black-mono half-tone test prints. Keep the prints stored. When making test print, use 160 for the CLC200 and 112 for the CLC300/350. • Use K2 and K3 when VCRCT-K of V-CONT has been changed; see below.	▷: 0, M, C, Y, K, K2, K3, and 3C in sequence. OK: execute. Ends automatically.
	SGNL-M C Y K REF- M C Y K	Select it to indicate the initial setting read under INIT. • Record the indicated setting on the label (Figure 3-1101.	

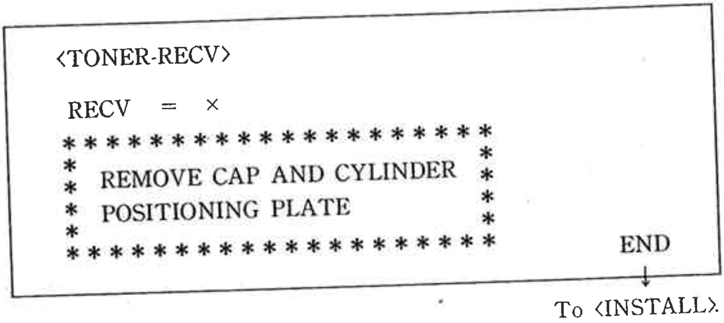
■ INIT = K2 and INIT = K3

- Execute them when VCRCTK of V-CONT has been changed.

1) Return the setting of VCRCTK to the value shown on the service label.
2) Bring up screen 'ATR-VR', press the ▷ key to select 'STIR = K', and press the OK key.
- Wait until the execution is complete (automatic).
3) Bring up screen 'ATR-INIT', press the ▷ key to select 'INIT = K2', and press the OK key.
- Wait until the execution is complete (automatic).
4) Set the setting of VCRCTK to a new value (of after adjustment).
5) Bring up screen 'ATR-INIT', press the ▷ key to select 'INIT = K3', and press the OK key.
- Wait until the execution is complete (automatic).
6) Press the RESET key.

Note:
When K2 and K3 are executed, the settings of SGNL-K are read and the difference thereof is registered; the difference is used to compute the change in the black toner concentration.

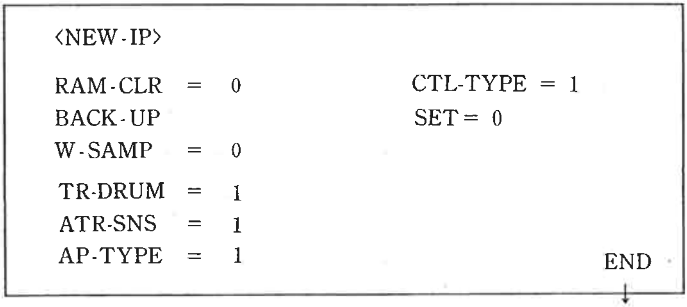
4. Collection of Developer



```
<TONER-RECV>

 RECV   =   ×
********************
*                  *
*  REMOVE CAP AND CYLINDER  *
*  POSITIONING PLATE        *
*                  *
********************                END
                                     ↓
                              To <INSTALL>
```

No.	Item	Description	Key operation
	RECV	Select it to draw out the developer from the developing assembly. ● Remove the cap from the developer supply mouth of the developing assembly, and relocate the electrode positioning plate in advance. ● The developer will be moving; take care. **Note:** This mode is NOT for installation.	▷: 0, M, C, Y, and K in sequence. OK: execute. C/⊗: end. Ends automatically in three minutes.

5. Upon Replacement of Image Processor PCB



```
<NEW-IP>

RAM-CLR   =  0                CTL-TYPE = 1
BACK-UP                       SET = 0
W-SAMP    =  0
TR-DRUM   =  1
ATR-SNS   =  1
AP-TYPE   =  1                          END
```

To <FUNCTION>.

No.	Item	Description	Key operation
	RAM-CLR	Select it to clear the contents of the RAM on the image processor PCB and to set the default settings.	▷ : 0 → 1 OK: execute. Ends automatically.
	BACK-UP	A press on the OK key returns back-up data input screen 1 'BACK-UP1'; be sure to execute SET after modifying the value.	
	W-SAMP	Select it to read the standard white density for shading correction. See page 3-183. • Set 10 or more sheets of copy paper on the copyboard glass in advance; use A3/LDG paper for color copies.	▷ : 0 → 1 OK: execute. Ends automatically.
	TR-DRUM	Make sure the setting suits the type of transfer drum; ROM for CLC300/350 only. 0 if CLC200 type, and 1 for CLC300/350 type. When changing the setting, execute SET.	standard: 1
	ATR-SNS	Make sure the setting suits the type of black toner density sensor inside the drum unit; ROM for CLC300/350 only. 0 if CLC200 type, and 1 for CLC300/350 type. When changing the setting, execute SET.	standard: 1
	AP-TYPE	Make sure the setting suits the type of analog processor PCB; ROM for CLC300/350 only. 0 if CLC200 type, and 1 if CLC300/350 type.	standard: 1
	CTL-TYPE	Reserved.	Keep it to '1'; the standard is '1'.
	SET	Transferring the data under BACK-UP, TR-DRUM, and ATR-SNS to the DC controller.	

6. Back-Up Data Input

```
<BACK-UP 1>
ODEV-B  =××      GAIN-B  =××
     G  =××           G  =××
     R  =××           R  =××
OFST-B  =××      ADJ-X  =±××
     G  =××          Y  =±××
     R  =××          S  =±××
```

```
<BACK-UP 2>
REG-X = ±××      TONE-TX =±××
    Y = ±××           PH =±××
   AB = ±××      SEG-ADJ  =±×
    C = ±××      BC-ADJ   =±×
 COLs = ±××
 COLp = ±××
```

```
<BACK-UP 3>

DA-XS = ××       DS-DOC = ××
   XE = ××          PRJ = ××
   YS = ××          OHP = ××
   YE = ××
```

```
<BACK-UP 4>

REG-ATT     = ±××
DVHP-ADJ    = ±×××
DVCL-TIME   = ±××
FUSER-MD    = ±×
```

```
<BACK-UP 5>

VBACKM = ±×      VCRCTM = ±×
     C = ±×           C = ±×
     Y = ±×           Y = ±×
     K = ±×           K = ±×
```

```
<BACK-UP 6>

SGNL-M = ×××     REF-M = ×××
     C = ×××         C = ×××
     Y = ×××         Y = ×××
     K = ×××         K = ×××
```

```
<BACK-UP 7>

PJRDXS = ±×××  PJDAXS = ±××
    XE = ±×××      XE = ±××
    YS = ±×××      YS = ±××
    YE = ±×××      YE = ±××
```

```
<BACK-UP 8>

EDADJX = ±××   SALT-M = ±×
     Y = ±××        C = ±×
RFAJRX = ×××        Y = ±×
    RY = ×××        K = ±×
    DX = ×××
    DY = ×××
```

BACK-UP1 through 8 are screens that show the items backing up the data under ADJUST and FUNCTION.

Store the data shown onto the label (Figure 3-1101) using these screens when the image processor PCB has been replaced.

No.	Item	Description
	ODEV-B	See 'CCD' of 'FUNCTION'.
	G	See 'CCD' of 'FUNCTION'.
	R	See 'CCD' of 'FUNCTION'.
	OFST-B	See 'CCD' of 'FUNCTION'.
	G	See 'CCD' of 'FUNCTION'.
	R	See 'CCD' of 'FUNCTION'.
	GAIN B	See 'CCD' of 'FUNCTION'.
	G	See 'CCD' of 'FUNCTION'.
	R	See 'CCD' of 'FUNCTION'.
	ADJ-X	See 'ADJ-XY' of 'ADJUST'.
	Y	See 'ADJ-XY' of 'ADJUST'.
	S	See 'ADJ-XY' of 'ADJUST'.**
	REG-X	See 'IMG-REG' of 'ADJUST'.
	Y	See 'IMG-REG' of 'ADJUST'.
	AB	See 'IMG-REG' of 'ADJUST'.
	C	See 'IMG-REG' of 'ADJUST'.
	COLs	See 'IMG-REG' of 'ADJUST'.**
	COLp	See 'IMG-REG' of 'ADJUST'.**
	TONE-TX	See 'A-MISC' of 'ADJUST'.
	PH	See 'A-MISC' of 'ADJUST'.
	SEG-ADJ	See 'A-MISC' of 'ADJUST'.
	BC-ADJ	See 'A-MISC' of 'ADJUST'.
	DA-XS	See 'DOC-REC' of 'ADJUST'.
	XE	See 'DOC-REC' of 'ADJUST'.
	YS	See 'DOC-REC' of 'ADJUST'.
	YE	See 'DOC-REC' of 'ADJUST'.
	DS-DOC	See 'DOC-REC' of 'ADJUST'.
	PRJ	See 'DOC-REC' of 'ADJUST'.
	OHP	See 'DOC-REC' of 'ADJUST'.
	REG-ATT	See 'ATTRACT' of 'FUNCTION'.
	DVHP-ADJ	See 'DEV' of 'FUNCTION'.
	DVCL-TIME	See 'DEV' of 'FUNCTION'.
	FUSER-MD	'FUNCTION' (fixing temperature switching)*
	VBACK-M	'FUNCTION' (Vback potential adjustment)*
	C	'FUNCTION' (Vback potential adjustment)*
	Y	'FUNCTION' (Vback potential adjustment)*
	K	'FUNCTION' (Vback potential adjustment)*
	VCRCT-M	'FUNCTION' (Vcount potential fine-adjustment)
	C	'FUNCTION' (Vcount potential fine-adjustment)
	Y	'FUNCTION' (Vcount potential fine-adjustment)
	K	'FUNCTION' (Vcount potential fine-adjustment)

* Need not be switched in the field; make sure the setting is as shown on the label.

** CLC300/350 only.

No.	Item	Description
	SGNL-M	See 'ATR-INIT' of 'FUNCTION'.
	C	See 'ATR-INIT' of 'FUNCTION'.
	Y	See 'ATR-INIT' of 'FUNCTION'.
	K	See 'ATR-INIT' of 'FUNCTION'.
	REF-M	See 'ATR-INIT' of 'FUNCTION'.
	C	See 'ATR-INIT' of 'FUNCTION'.
	Y	See 'ATR-INIT' of 'FUNCTION'.
	K	See 'ATR-INIT' of 'FUNCTION'.
	PJRD-XS	See 'PROJ' of 'ADJUST'.
	XE	See 'PROJ' of 'ADJUST'.
	YS	See 'PROJ' of 'ADJUST'.
	YE	See 'PROJ' of 'ADJUST'.
	PJDA-XS	See 'PROJ' of 'ADJUST'.
	XE	See 'PROJ' of 'ADJUST'.
	YS	See 'PROJ' of 'ADJUST'.
	YE	See 'PROJ' of 'ADJUST'.
	EDADJ-X	See 'RDF/ED' of 'ADJUST'.
	Y	See 'RDF/ED' of 'ADJUST'.
	RFAJ-RX	See 'RDF/ED' of 'ADJUST'.
	RY	See 'RDF/ED' of 'ADJUST'.
	DX	See 'RDF/ED' of 'ADJUST'.
	DY	See 'RDF/ED' of 'ADJUST'.
	SALT-M	See 'SALT' of 'FUNCTION'.**
	C	See 'SALT' of 'FUNCTION'.**
	Y	See 'SALT' of 'FUNCTION'.**
	K	See 'SALT' of 'FUNCTION'.**

** CLC300/350 only.

7. CCD Adjustment

```
<CCD>                    B      G      R
ODEV   =  0             ××     ××     ××
OFST   =  0             ××     ××     ××
LAMP   =  0            ×××    ×××
GAIN   =  0             ××     ××     ××
WSMP   =  0
TRGT   =               ×××    ×××    ×××   END
  ↓                                         ↓
To <SH-TRGT>.                        To <FUNCTION>.
```

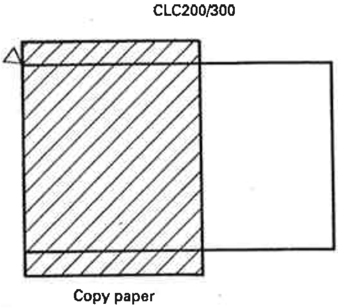
No.	Item	Description	Key operation
	ODEV	Select it to adjust the offset level difference between the analog processor odd/even bits. normal: 25 to 55	▷ : 0 → 1 OK: execute. Ends automatically.
	OFST	Select it to adjust the offset within the analog processor PCB. normal: 10 to 60	▷ : 0 → 1 OK: execute. Ends automatically.
	LAMP	Use it to adjust the intensity of the lamp. 1) Place copy paper or copy paper and the white density calibration plate on the copyboard glass; see the instructions. 2) Execute the mode, and turn the VR adjust. Sound: if absent (CW), clockwise; if at short intervals (CCW), counterclockwise; if continuous (OK), end of adjustment (245±5). 3) Press the C/⊽ key. **Note:** LAMP = 0$\underbrace{\times\times\times}_{\text{read data}}\underbrace{\times\times\times}_{\text{CW, CCW, OK}}$	▷ : 0 → 1 OK: execute C/⊽: end
	GAIN	Select it to adjust the gain within the analog processor PCB. normal: 16 to 60 • As in LAMP, set sheets of copy paper on the copyboard glass.	▷ : 0 → 1 OK: execute. Ends automatically.
	WSMP	The following items are read for shading correction: CLC200/300: standard white plate and density of copy paper. CLC350: density of standard white plate and bar code/density of white density calibration plate. • Like LAMP, place copy paper on the copyboard glass.	▷ : 0 → 1 OK: execute. Ends automatically.

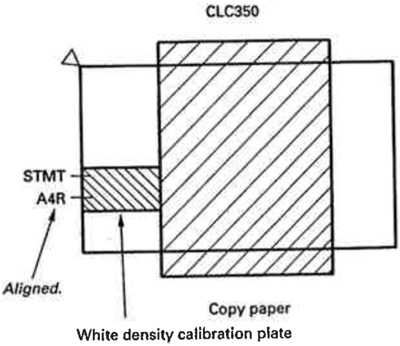
No.	Item	Description	Key operation
	TRGT	In the case of the CLC200, adjust the target value for shading correction (density of light areas and color balance). ● Perform the Image Adjustment Basic Procedure. ● If fogging is noted, increase the setting (330 max.). ● To improve reproducibility when the density is considerably low, decrease the setting. B → Y G → M R → C	▽: select ◁▷: adjust If TRGT is '1' and OK key is pressed, the modified value will be read in.
		In the case of the CLC300/350, a press on the OK key brings up the shading target adjustment screen 'SH-TRGT'.	

1. Execute the command under 'NEW-IP' if the image processor PCB has been replaced.
2. Execute ODEV through WSMP in sequence if the lens mount or analog processor PCB has been replaced.
3. Execute LAMP through WSMP in sequence if any of the document exposure systems (scanning lamp, lamp regulator, or lamp shade) has been replaced.
4. Execute WSMP only if the standard white plate has been replaced. reflectors have been cleaned.
5. Before executing LAMP, GAIN, or WSMP, be sure to check and clean the scanning lamp, reflector, mirror, standard white plate, and copyboard glass. If the portion of the standard white plate with the bar code must be cleaned for the CLC350, be sure to dry-clean the portion.

When placing copy paper or copy paper and the white density calibration plate, observe the following:

- Be sure to place copy paper or copy paper and the white density calibration plate when executing LAMP, GAIN, or WSMP.
- Make sure that the copy paper is A3/LDG intended for color copying, and place a stack of more than 10 sheets.
- Take care not to leave fingerprints or soil on the portion of the white density calibration plate painted white. If dirt is noted, dry-wipre the portion.
- If the bar code label attached to the white density calibration plate must be cleaned, dry-wipe it.





8. Shading Target Adjustment (CLC300/350 only)

```
   <SH-TRGT>
   POSI-  B = ×××        SET = 0
          G = ×××
          R = ×××
   NEGA-B = ×××
          G = ×××
          R = ×××                  END
                                    ↓
                               To <CCD>.
```

No.	Item	Description	Key operation
	POSI-B G R	Select it to adjust the target value for shading correction, thereby varying the density and the color balance of light areas. • This adjustment is possible only for the CLC300. • In the case of the CLC350, OFST under COL-ADJ can provide similar results. • Increase the setting if copies are foggy (330 max.). • To improve reproducibility when the density is considerably low, decrease the setting. B → Y G → M R → C	▽: select. ◁ ▷: adjust. Set to 'SET=1', and press the OK key to enter the value.
	NEGA-B G R	Select it to adjust the target value for shading correction used for making copies of negative film using the projector; adjustment of density and color balance. • Increase the value to darken the copies. B → Y G → M R → C	▽: select ◁ ▷: adjust. Setting 'SET=1' is not necessary.

POSI-BGR
POSI-BGR is not the target value for positive film; it is the target value when the projector is not used. The target value for positive film changes automatically when 'ADJUST TONE' is modified in the user mode but cannot be changed in the service mode.

NEGA-BGR

i. When the setting is changed, the image will change regardless of whether the automatic color adjustment mechanism is enabled or disabled; however, keep the mechanism OFF (AE indicator OFF) when making adjustments.

ii. The target value (NEGA-BGR) which produces ideal copy images varies depending on the type of negative film. It is set at time of shipment to a value that enables good image reproduction for any type of film.
Changing the setting of 'NEGA-BGR' enables improvement of copies from a specific negative film; however, such may deteriorate copies form other types of film.
Make use of the mechanism only if the user tends to use a specific type of negative film more or less exclusively and desires the best results for that type of film. Advise the user, however, that this is at the expense of copies from other types of film.

9. Adjusting the Laser

```
<LASER>

POWER  =   0                         TONE-TX =   ±××
LASER  =   0                              PH =   ±××
BD     =   0
TEMP   =   ×××℃

                                               END
```

↓
To <FUNCTION>.

For details of the adjustment, see the SERVICE HANDBOOK.

No.	Item	Description	Key operation
	POWER	Select it to adjust the laser power; laser ON.	▷ : 0 → 1 OK: execute. C/⊽: end.
	LASER	Select it to adjust the laser; laser ON.	▷ : 0 → 1 → 2 → 3 → 4 → 5 OK: execute. C/⊽: end.
	BD	Select it to check BD; laser ON; CLC200 only. ● Not only the laser, but also the laser scanner motor will go ON; the mode is for factory use only and should not be used in the field.	▷ : 0 → 1 OK: execute. C/⊽: end.
	TEMP	Select it to display the temperature around the laser.	
	TONE-TX PH	Correcting the Copy Density Select it to correct the copy density in the image processing unit. +: darker −: lighter TX: when in text mode PH: when in photo mode ● As a rule, make adjustments if laser correction is necessary; see p. 3-214. If the TONE-PH is modified, replace the black developer, adjust the black toner density VR (SGNL-K, REF-K), and read in the black toner concentration initial value.	- 19 to + 19 standard: 0

Table 3-1126

10. Checking and Adjusting the Developing Assembly Movement

```
<DEV>

DVHP-ADJ   =  ±×××
HP-SRCH    =  0
DEV-MOVE   =  0
DVCL-TIME  =  ±××
DVCL-CHK   =  0
                                   END
                                    ↓
                              To <FUNCTION>.
```

No.	Item	Description	Setting/key operation
	DVHP-ADJ	Adjusting the Developing Assembly Base Home Position +: The developing assembly base home position and stop position for development move to the right. −: The above move to the left. Press the ◁ or ▷ key to change the setting.	−127 to +127 (−7.2 to 7.2 mm) unit = 0.06 mm (approx.) • Use it within −30 to +10. • Turn the power OFF and ON first; then, check.
	HP-SRCH	Executing the Development Assembly Base Home Position Search Press the ▷ and OK keys to execute the home position search.	▷ : 0 → 1 OK: execute. Ends automatically.
	DEV-MOVE	Moving to the Development Assembly the Point of Development • The developing assembly will start to move and stops at the point of development selected.	▷ : 0 → M → C → Y → K → HP OK: execute. Ends automatically.
	DVCL-TIME	Adjusting the Development Assembly Push-Up Clutch Control Time Select it to adjust the timing at which the developing assembly clutch goes ON so that the developing cylinder stops when it is engaged with the photosensitive drum while the developing assembly moves; as a rule, do not change the setting which is set automatically under 'DVCL-CHK'.	−30 to +30 unit: 1 ms • Turn the power OFF and ON; then, check.
	DVCL-CHK	Checking the Developing Assembly Push-Up Clutch Movement The developing assembly will be engaged and released several times (minutes) and 'DVCL-TIME' will be set automatically to the optimum setting.	▷ : 0 → 1 OK: execute. Ends automatically.

11. Adjusting the Point of Attraction

```
<ATTRACT>

REG-ATT   =  ±×××
ATTRACT   =  0



                                  END
                                   ↓
                          To <FUNCTION>.
```

No.	Item	Description	Setting/key operation
	REG-ATT	Fine-Adjusting the Point of Attraction on the Transfer Drum Make adjustments under 'ATTRACT' so that the copy paper on the transfer drum is at the standard position; a different setting will change the registration roller ON timing. • Make adjustments as shown on the next page.	−64 to +64 (−10.75 to +10.75 mm) unit: 0.17 mm (approx.)
	ATTRACT	Attraction of Copy Paper to the Transfer Drum Select it to check or adjust REG-ATT. When executed, copy paper will be picked up, and the operation will stop with the paper on the transfer drum. Be sure to remove the paper by hand after checks have been made.	▷: 0 → 1 OK: execute. Ends automatically.

Checking and Adjusting the Point of Attraction on the Transfer Drum

1) Press the ▽ key on screen 'ATTRACT' to select ATTRACT.
2) Press the ▷ key to bring up 'ATTRACT=1' and press the OK key.
- Copy paper will be picked up and placed on the transfer drum, and the operation will stop.
- At the time, no high-voltage output but of attraction is ON.

3) Check the position of the arrow on the transfer drum sheet and the position of the copy paper, and remove the paper.
4) Press the △ key to select 'REG-ATT'.
5) Perform the following; if, in step 3),
- a gap is noted between the arrow and copy paper, press the ▷ key to increase the setting.
- the arrow is hidden, press the ◁ key to decrease the setting.

6) Turn the power switch OFF and ON after adjustment.
- Be sure to turn the switch OFF and ON; otherwise, no image will be obtained in the normal copy mode.

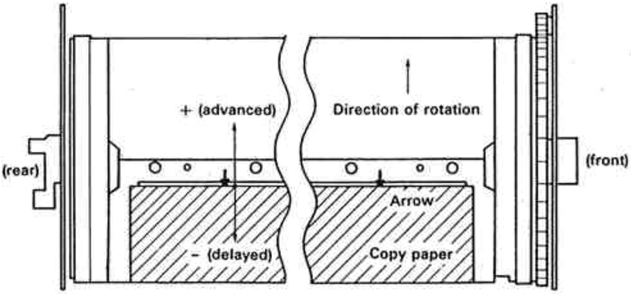


Figure 3-1104

12. Measuring the Photosensitive Drum Potential

```
<EPC>

EPC  =  0
CHK  =  0
POT  =  ±×××     ±×××
     =  ±×××     ±×××
     =  ±×××     ±×××
                                END
                                 ↓
                          To <FUNCTION>.
```

<table>
<tr><th>No.</th><th>Item</th><th>Description</th></tr>
<tr><td></td><td>EPC</td><td>Executing the Photosensitive Drum Potential Measurement
1) Press the key to select 1 or 2.; 0 → 1 → 2.
1: photo mode
2: text mode
2) Press the OK key to execute potential measurement.</td></tr>
<tr><td></td><td>CHK</td><td>Turning the Potential Control OFF: CLC300/350 only
● Use it to check potential sensor and potential measurement PCB with ease, mainly in response to E061.
● When the COPY START key is pressed with the potential control mechanism OFF, conditions represented by 'E061' will not be identified, and copies are made using a fixed-value grid bias and development bias DC component.
▷ : 0 → 1
OK: execute (returns to potential control ON in five minutes after execution)
● To return to potential control ON without waiting for five minutes, switch the machine OFF and then ON.</td></tr>
<tr><td></td><td>POT</td><td>Displaying the Photosensitive Drum Potential Measurement
In response to the following, the indication will be as shown in the table below.
POT = ± ×××① ±×××②
± ×××③ ±×××④
± ×××⑤ ±×××⑥
<table>
<tr><th>Grid bias</th><th colspan="2">Laser intensity</th><th>Normal</th></tr>
<tr><td>V_G
−300 ($V_{G}1$)
−500 ($V_{G}2$)
−800 ($V_{G}3$)</td><td>V_{OO} (V_D)
① ($V_{D}1$)
③ ($V_{D}2$)
⑤ ($V_{D}3$)</td><td>V_{ff} (V_L)
② ($V_{L}1$)
④ ($V_{L}2$)
⑥ ($V_{L}3$)</td><td>$-30 > V_{L}1 > -80$
$-50 > V_{L}2 > -100$
$-80 > V_{L}3 > -140$
$-260 > V_{D}1 > -350$
$-430 > V_{D}2 > -520$
$-660 > V_{D}3 > -760$</td></tr>
</table>
</td></tr>
</table>

13. Drum Toner Density Control (CLC300/350 only)

```
 <SALT>
  SALT-ON  =  0          TEST-PG  = 0
       ACT =  0          ERR = ×××××××
       M   =  ±×              SET  = 0
       C   =  ±×
       Y   =  ±×
       K   =  ±×
                                         END
                                          ↓
                                  To <FUNCTION>.
```

No.	Item	Description	Key operation
	SALT-ON	Select it to prohibit the drum toner density control mechanism. • When set to '0', correction of the target contrast potential and gradation will not be executed. • Be sure to set it to '1' after installation of the machine. • Standard is '0'; at shipment, '0'.	◁,▷ : 0 → 1 Be sure to set it to 'SET=1'.
	SALT-ACT	Select it to execute the drum toner density control mechanism. • The drum toner density control mechanism will be executed. • Execute it after cleaning the black toner concentration sensor or replacing the photosensitive drum.	▷: 0 → 1 OK: execute. Ends automatically 2.5 min later (approx.)
	SALT-M C Y K	Select it to set the black toner density sensor correction coefficient. • Adjust the read level for the concentration of the toner on the drum. • Reserved. (for factory) • When set to 'SET=1', the value will be read in.	▽: select. ◁▷ : adjust. −7 to +7 standard: MCY=+3 K=0
	TEST-PG	Select it to generate the test print for checking the drum toner density control mechanism. • When set to 'laser output A0' (160), the MCYBk horizontal strip test print will be generated. • At the time, the output will be based on the following depending on the setting under SALT-ON. SALT-ON=1: outputs an image with correction for the target contrast potential and gradation. SALT-ON=0: outputs an image without the above.	

No.	Item	Description	Key operation
	SALT ERR	Indicates an error occurring while the drum toner density control mechanism is being executed. ● If there is an error, control will not be executed and the correction value decided most recently will be used; take any of the appropriate measures. XXXXXXX └ Bk solid faulty └ Y solid faulty └ C solid faulty └ M solid faulty └ Reserved └ Black toner concentration sensor soiled └ Gradation correction data error	
	SET	Use it to transfer the data of SALT-ON and SALT-M, -C, -Y, and -K to the DC controller.	

a. Solid Black Faulty

Cause

The resolution capability has deteriorated.

Remedy

Check the developing assembly for the color suffering the fault.

b. Dirt on Black Toner Concentration Sensor

Cause

build-up of dirt on the sensor window; or, wrong setting of SGNL-K of ATR-VR

Remedy

1) Wipe the window of the sensor using lint-free paper moistened with alcohol.
   - Use alcohol with high purity.
   - Do not dry wipe it to prevent spread of dirt.
2) Re-set SGNL-K (VR981) and REF-K (VR982) under ATR-VR.
3) Execute control (SALT-ACT = 1).

c. Error in Gradation Correction Data

Cause

The photosensitive drum has deteriorated, or there is residual memory.

Remedy

1) Disengage the transfer drum, change its orientation with the photosensitive drum, and execute the control mechanism once again (SALT - ACT = 1).
2) Set TEST PRINT as follows if the error persists after step 1) above, and make a copy using cyan (mono).
   - PGTYPE = 5 (full half-tone)
   - DENS-C = 50 (density 50)

   If irregularity (250 mm pitch) attributed to the photosensitive drum is still noted, replace the drum.

14. Other Functions (CLC200)

```
<F-MISC>
LED-CHK   =  0        NIP-CHK   =  0
SC-MOVE   =  0        WIRE-CL   =  0
LAMP-ON   =  0        E000-RL   =  0
HV-MODE   =  ×××      PJ-LAMP   =  0
OUTPROG   =  ×××      FILTIMG   =  0
   DT =   ×     ×                      END
                                        ↓
                              To <FUNCTION>.
```

No.	Item	Description	Key operation
	LED-CHK	Select it to check the LEDs on the control panel.	▷ : 0 ↔ 1 Flashes.
	SC-MOVE	Each execution of the scanner movement check causes HP → A → B → C to be repeated.	▷ : 0 → 1 OK: execute. Ends automatically.
	LAMP-ON	Select it to cause the scanning lamp to go ON; do not keep it ON more than 10 sec.	▷ : 0 ↔ 1 OFF and ON
	HV-MODE	Select it to check the high voltage; see Table 3-1107 for operation modes. • After the check, select No. 001, and press the ON key.	◁ , ▷ : mode No. OK: execute.
	OUTPROG	Select the No. of the DC controller input/output check.; see Table 3-1108, 1109, 1110 and 1111.	◁ , ▷ : mode No.
	DT	Select it to choose the output data of OUTPROG and to display the input data. DT = × × Output data Input data	At time of output only. ▷ : 0 ↔ 1 OK: execute.
	NIP-CHK	Select it to measure the fixing assembly nip; the operation will stop at the point of fixing, and the copy paper will be delivered.	▷ : 0 → 1 COPY START: execute. Ends automatically.
	WIRE-CLN	Select it to clean the primary corona unit wire. 1: front → rear → front 2: front → rear 3: rear → front	▷ : 0 → 1 → 2 → 3 OK: execute. Ends automatically.
	E000-RLS	Select it to clear 'E000'; be sure to shift the POWER switch OFF and ON thereafter.	▷ : 0 → 1 → 0 OK: execute.
	PJ-LAMP	Select it to cause the illumination lamp of the film projector to go ON; do not keep the lamp ON for 5 min or more.	▷ : 0 ↔ 1 OFF and ON C/⊘ : OFF
	FILTIMG	Select it to check the output of each CCD (BGR). • A press on the COPY START key brings about separate copies of B, G, and R CCD outputs in cyan mono.	▷ : 0 → 1 COPY START: execute. Ends automatically.

15. Other Functions (scanner-related) (CLC300/350)

```
<F-MISCs>
LED-CHK   =  0
SC-MOVE   =  0
LAMP-ON   =  0
PJ-LAMP   =  0
FILTIMG   =  0
SC-CHK
                                   END
                                    ↓
                              To <FUNCTION>.
```

No.	Item	Description	Key operation
	LED-CHK	Select it to check the LEDs on the control panel. • Ends automatically in 5 sec.	▷ : 0 ↔ 1 Flashes.
	SC-MOVE	Each execution of the scanner movement check causes HP → A → B → C to be repeated.	▷ : 0 → 1 OK: execute. Ends automatically.
	LAMP-ON	Select it to cause the scanning lamp to go ON. • Ends in 5 sec.	▷ : 0 ↔ 1 OFF and ON
	PJ-LAMP	Select it to cause the illumination lamp of the film projector to go ON; do not keep the lamp ON for 5 min or more. • Ends automatically.	▷ : 0 ↔ 1 OFF and ON C/⊘ : OFF
	FILTIMG	Select it to check the output of each CCD (BGR). • A press on the COPY START key brings about separate copies of B, G, and R CCD outputs in cyan	▷ : 0 → 1 COPY START: execute. Ends automatically.
	SC-CHK	For factory use; CLC350 only.	

16. Other Functions (printer-related) (CLC300/350)

```
<F-MISCp>

 NIP-CHK  = 0        HV-MODE  = ×××

 WIRE-CL  = 0        OUTPROG  = ×××

 TDRM-CL  = 0             DT  = ×  ×

 E000-RL  = 0
                                        END
                                         ↓
                                  To <FUNCTION>.
```

No.	Item	Description	Key operation
	NIP-CHK	Select it to measure the fixing assembly nip; the operation will stop at the point of fixing, and the copy paper will be delivered.	▷ : 0 → 1 COPY START: execute. Ends automatically.
	WIRE-CLN	Select it to clean the primary corona unit wire. 1: front → rear → front 2: front → rear 3: rear → front	▷ : 0 → 1 → 2 → 3 OK: execute. Ends automatically.
	TDRM-CL	Select it to clean the transfer drum. • Make sure there is no paper jam inside the machine before execution.	▷ : 0 → 1 OK: execute. Ends automatically.
	E000-RLS	Select it to clear 'E000'; be sure to shift the POWER switch OFF and ON thereafter.	▷ : 0 → 1 → 0 OK: execute.
	HV-MODE	Select it to check the high voltage; see Table 3-1107 for operation modes. • After the check, select No. 001, and press the ON key.	◁ , ▷ : mode No. OK: execute.
	OUTPROG	Select the No. of the DC controller input/output check.; see Table 3-1108, 1109, 1110 and 1111.	◁ , ▷ : mode No.
	DT	Select it to choose the output data of OUTPROG and to display the input data. DT = × × Output data Input data	At time of output only. ▷ :0 ↔ 1 OK: execute.

Points to Note in Using the High-Voltage Check Mode
Select No. 001, and press the OK key after checks have been made.

1. Cause the following load to go ON before causing the attraction, internal/external static eliminator, and separation high voltages and the pre-exposure lamp to go ON.
   ① Drum motor (044)
2. Cause the following loads to go ON before causing the primary corona grid bias and pre-cleaning corona high voltages to go ON.
   ① Drum motor (044)
   ② Pre-exposure lamp (045)
3. Cause the following loads to go ON before causing the primary corona high voltage to go ON.
   ① Drum motor (044)
   ② Pre-exposure lamp (045)
   ③ Primary corona grid bias (087)
4. Cause the following loads to go ON before causing the transfer corona high voltage to go ON.
   ① Drum motor (044)
   ② Pre-exposure lamp (045)
   ③ Primary corona grid bias (087)
   ④ Primary corona (036)

No.	Output		DC Controller	
			Voltage	Signal Connector No. (check pin No.)
001	All high voltages OFF (DC, AC, drum motor, pre-exposure)			
002	All DC high voltages OFF			
003	All AC high voltages OFF			
016	Attraction corona (i)	OFF	17 V (approx.)	HVATC J319-6 (J326-1)
048		ON	9.5 V (approx.)	
011	Transfer corona (iv)	OFF	17 V (approx.)	HVTRC J319-5 (J326-2)
108		ON	9.5 V (approx.)	
036	Primary corona (iii)	ON	0 V (approx.)	HVPR* J319-1
020		OFF	24 V (approx.)	
018	Developing bias (DC component)	OFF	17 V (approx.)	HVDCC J319-2 (J326-5)
095		ON	8.0 V (approx.)	
021	Internal static eliminator (DC component; i)	OFF	7 V (approx.)	HVISEDCC J318-4 (J326-7)
064		ON	15.5 V (approx.)	
019	Primary corona grid bias (ii)	OFF	17 V (approx.)	HVGBC J319-4 (J326-4)
087		ON	9 V (approx.)	
022	External static eliminator (DC component; i)	OFF	7 V (approx.)	HVESEDCC J318-2 (326-7)
072		ON	12 V (approx.)	
023	Pre-cleaning corona (DC component; ii)	OFF	7 V (approx.)	HVPCDCC J318-5 (J326-6)
059		ON	9.5 V (approx.)	
024	Developing bias (AC component)	OFF	24 V (approx.)	HVAC* J319-3
040		ON	0 V (approx.)	
025	Internal/external static eliminator (AC component; i)	OFF	24 V (approx.)	HVSEAC* J318-3
041		ON	0 V (approx.)	
026	Separation corona (AC component; i)	OFF	24 V (approx.)	HVSPAC* J318-1
042		ON	0 V (approx.)	
027	Pre-cleaning corona (AC component; ii)	OFF	24 V (approx.)	HVPCAC* J318-6
043		ON	0 V (approx.)	
028	Drum motor (M2)	OFF	24 V (approx.)	DRMD* J307-1
044		ON	0 V (approx.)	
029	Pre-exposure lamp (i)	OFF	24 V (approx.)	PEXP* J304-8B
045		ON	0 V (approx.)	

Table 3-1107 Checking the High-Voltage

No.	Item	Input/ Output	Signal	Connector No.	Remarks
0	OHP sensor (pre-registration sensor)	IN	OHPD	J314-12B	0: paper is present.
1	Attraction jam sensor (PS18)	IN	PS18D*	J305-8	0: paper is present.
2	Transfer jam sensor (PS19)	IN	PS19D*	J305-9	0: paper is present.
3	Transfer drum pre-cleaning sensor (PS20)	IN	PS20D*	J305-10	0: paper is present.
4	Separation sensor (PS10)	IN	PS10D	J306-2	1: paper is present.
5	Delivery sensor (PS9)	IN	PS9D	J317-10	1: paper is present.
6	Upper cassette lifter limit sensor (PS11)	IN	ULFTP	J314-9A	1: lifter is up.
7	Lower cassette lifter limit sensor (PS12)	IN	LLFTP	J314-10A	1: lifter is up.
8	Upper cassette size switch 0	IN	UCSZ0	J314-2B	0: switch is ON.
9	Upper cassette size switch 1	IN	UCSZ1	J314-3B	0: switch is ON.
10	Upper cassette size switch 2	IN	UCSZ2	J314-4B	0: switch is ON.
11	Upper cassette size switch 3	IN	UCSZ3	J314-5B	0: switch is ON.
12	Lower cassette size switch 0	IN	LCSZ0	J314-6B	0: switch is ON.
13	Lower cassette size switch 1	IN	LCSZ1	J314-7B	0: switch is ON.
14	Lower cassette size switch 2	IN	LCSZ2	H314-8B	0: switch is ON.
15	Lower cassette size switch 3	IN	LCSZ3	J314-9B	0: switch is ON.
16	M developing cylinder clutch (CL1)	OUT	CL1D*	J303-5B	1: CL1 is ON.
17	C developing cylinder clutch (CL2)	OUT	CL2D*	J303-6B	1: CL2 is ON.
18	Y developing cylinder clutch (CL3)	OUT	CL3D*	J303-7B	1: CL3 is ON.
19	Bk developing cylinder clutch (CL4)	OUT	CL4D*	J303-8B	1: CL4 is ON.
20	M toner concentration sensor lamp	OUT	MLAON*	J303-1B	1: ON.
21	C toner concentration sensor lamp	OUT	CLAON*	J303-2B	1: ON.
22	Y toner concentration sensor lamp	OUT	YLAON*	J303-3B	1: ON.
23	Bk toner concentration sensor lamp	OUT	BKLAON*	J304-6A	1: ON.
28	Laser/power supply cooling fan (FM6)	OUT	FM6D*	J304-10B	1: FM6 is ON.
29	Separation push-up solenoid (SL1)	OUT	SL1D*	J305-2	1: SL1 is ON.
30	Inside brush solenoid (SL2)	OUT	SL2D*	J305-3	1: SL2 is ON.
31	Reserved.				
32	Separation claw solenoid (SL13)	OUT	SL13D*	J306-5	1: SL13 is ON.
33	Feeder fan (FM9)	OUT	FM9D*	J306-7	1: FM9 is ON.
34	Drum motor (M2)	OUT	DRMD*	J307-1	1: M2 is ON.
35	Laser scanner motor (M3)	OUT	LSMD*	J307-5	1: M3 is ON.
44	M toner supply clutch (CL6)	OUT	CL6D*	J309-6A	1: CL6 is ON.
45	C toner supply clutch (CL7)	OUT	CL7D*	J309-7A	1: CL7 is ON.
46	Y toner supply clutch (CL8)	OUT	CL8D*	J309-8A	1: CL8 is ON.

Note:
'1' and '0' as used in the Remarks column are opposite of '1' and '0' used to refer to the voltages on connectors.

Table 3-1108 Checking the Input/Output of the DC Controller

No.	Item	Input/ Output	Signal	Connector No.	Remarks
47	Bk toner supply clutch (CL9)	OUT	CL9D*	J309-9A	1: CL9 is ON.
48	Image leading edge sensor (PS3)	IN	ILEG	J305-6	1: Image leading edge.
49	A-side sensor (PS4)	IN	ASD	J305-7	1: A-side.
50	Laser scanner motor ready	IN	LSMRDY*	J307-6	0: rotation as specified.
51	Main motor ready	IN	MMRDY*	J313-8B	0: rotation at specified speed.
52	Drum motor ready	IN	DRMRDY*	J307-4	
56	Developing assembly engagement cam OFF sensor (PS2)	IN	DOFF	J316-4	1: Developing assembly released.
57	Developing assembly engagement cam TOP sensor (PS1)	IN	DTOP	J316-5	1: Developing assembly engaged.
58	Counter sensor	IN		on PCB	1: counter is present.
59	Oil level sensor (PS8)	IN	DEP*	J317-8	0: oil is absent.
60	Belt length sensor (PS8)	IN	CBOUT	J317-9	1: belt is absent.
61	Upper cassette paper sensor (PS15)	IN	PS15D	J314-13A	1: paper is present.
62	Lower cassette paper sensor (PS16)	IN	PS16D	J314-14A	1: paper is present.
63	Manual mode sensor (PS14)	IN	MFS	J314-12A	1: manual mode position.
64	Counter 1 (CNT1)	OUT	CNTD1*	J309-2B	1: CNT1 is ON.
65	Counter 2 (CNT2)	OUT	CNTD2*	J309-3B	1: CNT2 is ON.
66	Counter 3 (CNT3)	OUT	CNTD3*	J309-4B	1: CNT3 is ON.
67	Counter 4 (CNT4)	OUT	CNTD4*	J309-5B	1: CNT4 is ON.
68	Scanning lamp cooling fan 1/2 (FM4, FM5)	OUT	FM4D* FM5D*	J310-2 J310-4	1: FM4/5 is ON.
71	Development fan (FM9)	OUT	FM9D*	J309-A11	1: FM9 is ON.
77	Offset tray drive signal	OUT	SHIFT*	J312-2	1: offset tray moves.
80	Registration roller clutch (CL14)	OUT	CL14D*	J313-6A	1: CL14 is ON.
81	Attraction solenoid (SL7)	OUT	SL7D*	J313-4A	1: SL7 is ON.
82	Transfer drum cleaner motor (M7)	OUT	TDCLMD*	J313-8A	1: M7 is ON.
83	Transfer drum cleaner solenoid (SL10)	OUT	SL10D*	J313-6B	1: SL10 is ON.
84	Main motor (M1)	OUT	MMD*	J313-7B	1: M1 is ON.
85	Feeding speed change solenoid (SL8)	OUT	SL8D*	J313-2B	1: SL8 is ON.
86	Fixing speed change solenoid (SL9)	OUT	SL9D*	J313-4B	1: SL9 is ON.
87	Fixing heat exhaust fan (FM7)	OUT	FM7D*	J313-2A	1: FM7 is ON.
88	Upper cassette lifter clutch (CL10)	OUT	CL10D*	J314-3A	1: CL10 is ON.
89	Lower cassette lifter clutch (CL11)	OUT	CL11D*	J314-4A	1: CL11 is ON.

Note:
'1' and '0' as used in the Remarks column are opposite of '1' and '0' used to refer to the voltages on connectors.

Table 3-1109 Checking the Input/Output of the DC Controller

No.	Item	Input/ Output	Signal	Connector No.	Remarks
90	Upper cassette pick-up clutch (CL12)	OUT	CL12D✳	J314-5A	1: CL12 is ON.
91	Lower cassette pick-up clutch (CL13)	OUT	CL13D✳	J314-6A	1: CL13 is ON.
92	Pick-up roller release solenoid (SL14)	OUT	SL14D✳	J314-7A	1: SL14 is ON.
93	Developing assembly push-up clutch (CL5)	OUT	CL5D✳	J316-2	1: CL5 is ON.
99	Drum motor clock (M2)	IN	DRMCLK	J307-3	
100	Communications signal (image processor)	IN	IPPRDY	J308-3A	1: power is ready.
101	Communications signal (image processor)	IN	PDO-WNREQ	J308-6A	1: REQ
102	Communications signal (image processor)	IN	IPORTO	J308-8A	
103	Manual feed paper sensor (PS13)	IN	PS13D	J314-11A	1: paper is present.
104	Right door switch 1 (SW3)	IN	RDC✳	J304-1B	1: door is open.
105	Left door switch (SW4)	IN	LDC✳	J304-5B	1: door is open.
106	Key switch (SW5)	IN	KEYL✳	J304-3B	1: security key is absent.
107	Waste toner sensor	IN	WTOUT	J310-7	1: FULL
108	M toner level sensor (TS1)	IN	MTEP✳	J309-7B	0: below specified level.
109	C toner level sensor (TS2)	IN	CTEP✳	J309-8B	0: below specified level.
110	Y toner level sensor (TS3)	IN	YTEP✳	J309-9B	0: below specified level.
111	Bk toner level sensor (TS4)	IN	BKTEP✳	J309-10B	0: below specified level.
112	Cleaning belt solenoid (SL11)	OUT	SL11D✳	J317-2	1: SL11 is ON.
113	Oil application solenoid (SL12)	OUT	SL12D✳	J317-3	1: SL12 is ON.
132	Counter mode switch jumper connector	IN		J324-1	0: 100/220/240V
133	Counter mode switch jumper connector	IN		J324-3	0: 115/220V AMS
134	Reserved.				
135	Reserved.				
136	Developing cylinder motor (M6) error	IN		on PCB	0: error
137	Transfer drum cleaner motor (M7) error	IN		on PCB	0: error
138	Offset tray connect	IN	CONNECT✳	J312-4	0: offset tray is present.
139	Reserved.	IN		J325-6	

Note:
'1' and '0' as used in the Remarks column are opposite of '1' and '0' used to refer to the voltages on connectors.

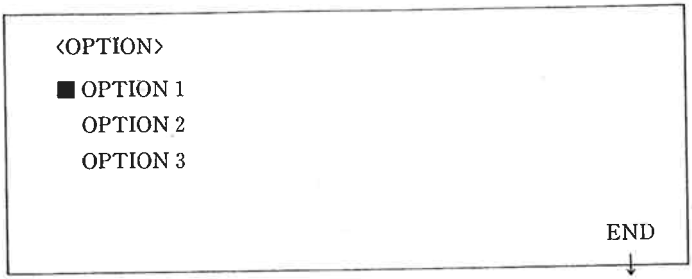
Table 3-1110 Checking the Input/Output of the DC Controller

No.	Item	Input/ Output	Signal	Connector No.	Remarks
140	For factory.	IN		J323-1	
141	For factory.	IN		J323-2	
142	For factory.	IN		J323-3	
143	For factory.	IN		J323-4	

Note:
'1' and '0' as used in the Remarks column are opposite of '1' and '0' used to refer to the voltages on connectors.

Table 3-1111 Checking the Input/Output of the DC Controller

E. Options Mode (OPTION)



<OPTION>

■ OPTION 1

OPTION 2

OPTION 3

END

To <SERVICE>.

OPTION Screen

1. CLC200

1) Press the ▽ or △ key to select items under screens 'OPTION1' through 'OPTION4'.
2) Press the ◁ or ▷ key to change the settings, and press the OK key.

- For descriptions on OPTION4, see those given for 'TEST PRINT'.

2. CLC300/350

a. Selection the Item Screen

1) Press the ▽ or △ key to select the item, and press the OK key.

- The screens for the selected items shown on the pages that follow will be brought up.

b. Operation on Item Screen

1) Press the ▽ or △ key to select the item.
2) Press the ◁ or ▷ key to change the value.
3) Press the OK key to enter the value.

1. OPTION1

```
<OPTION 1 >
AUTO-CLR   =   2        FILM-DIR  =  0
PRE-HEAT   =   30
SHUT-OFF   =   120
BEEP-OFF   =   0
LCD-DISP   =   0
ACC-OFF    =   0
```

No.	Item	Description	Remarks
	AUTO-CLR	Select it to set the standard mode return time.	0 to 9 standard: 2 unit: 1 min 0: no automatic return
	PRE-HEAT	Select it to set the auto pre-heat mode time.	0 to 60 standard: 30 unit: 1 min 0: no auto pre-heat
	SHUT-OFF	Select it to set the auto shut-off time.	60 to 360 standard: 120 unit: 1 min 0: no auto shut-off
	BEEP-OFF	Select it to de-activate the buzzer.	1: no buzzer
	LCD-DISP	Select it to change the LCD negative/positive.	0: white against blue background 1: blue against white background
	ACC-OFF	Select it to de-activate the auto cassette change mechanism. When the cassette in the cassette holder runs out of paper in the continuous mode, the other holder will be selected automatically if it holds a cassette with paper of the same size.	1: no auto cassette change
	FILM-DIR	Select it to set the film orientation; CLC300/350 only. This sets how to check the orientation (vertical/horizontal) of the film when film is set in the carrier of the projector with document identification OFF. 0: vertical/horizontal orientation of film; automatic. 1: adapts to orientation of paper; vertical if A3, A4R, LDG, LTR; horizontal if A4, LTR. 2: fixed to vertical. 3: fixed to horizontal.	

2. OPTION2

```
<OPTION 2 >
P-SIZE    =  0         PS/IPU    =  1
DECK      =  0         PS-TYPE   =  1
ITL       =  1         PS-PANEL  =  0
MP-ADJ    =  ×××       REMOTE    =  0
S-TYPE    =  1
DENS.IND  =  0
```

No.	Item	Description	Remarks
	P-SIZE	Select it to identify the size of the document coming from the RDF and the size of the copy paper and OHP film checked at time of the manual feed mode (copying machine; as AB- or inch-size).	0: AB 1: Inch
	DECK	Set it to 1 when the paper deck is attached. • In response to 'E040' (lifter fault), 'DOOR OPEN' will be indicated instead of 'E040'.	Turn the power OFF and ON after modifying the setting.
	ITL	Select it for a 'slant' effect to IMAGE CREATE.	0: OFF 1: ON Standard: 1
	MP-ADJ	Select it to decide on the binding width (overlapping of images) on copies for the ENLARGE/PAGE SEPARATION mode.	0 to 200 standard: 50 unit: 0.06 mm (approx.)
	S-TYPE	Select it to prevent uneven magenta (photo document). When set to '1', the laser control mechanism changes to suppress uneven magenta reproduction.	1: ON standard: 1
	DENS.IND	Select it to set the resolution by the COPY DENSITY key (9/17 steps); CLC300/350 only.	0: 9 steps 1: 17 steps
	PS/IPU	Select it to switch between IPU and PS-IPU; CLC300/350 only. • Set it to 0 when connecting to the Extension Board or Film Scanner II.	0: IPU 1: PS-IPU
	PS-TYPE	Select it to set the type of PS-IPU; CLC300/350 only.	0: CLC300/500 1: CLC500
	PS-PANEL	Select it to enable some operations of PS-IPU from the CLC300/350 control panel; CLC300/350 only. • cassette selection, color or black/white	1: display

<table>
<tr><th>No.</th><th>Item</th><th>Description</th></tr>
<tr><td></td><td>REMOTE</td><td>Select it to set A, B, and C below (with IPU, PS-IPU, or Film Scanner II connected); CLC300/350 only.
A: whether to use the call key as a remote key or not; if not, the execute command from the IPU or PS-IPU enables the remote mode; after execution, the local mode is enabled again.
B: whether to carry over the copy modes set in the local mode or reset them when shifting from local to remote.
C: whether to enable the local or remote mode when the RESET key is pressed in the local mode at time of power-on.
<table>
<tr><th>Setting</th><th>A</th><th>B</th><th>C</th></tr>
<tr><td>REMOTE = 0, 1</td><td>call key</td><td>carry over</td><td>local</td></tr>
<tr><td>2, 3</td><td>call key</td><td>rest</td><td>local</td></tr>
<tr><td>4</td><td>remote key</td><td>carry over</td><td>local</td></tr>
<tr><td>5</td><td>remote key</td><td>carry over</td><td>remote</td></tr>
<tr><td>6</td><td>remote key</td><td>reset</td><td>local</td></tr>
<tr><td>7</td><td>remote key</td><td>reset</td><td>remote</td></tr>
</table>
The standard setting is '0'.</td></tr>
</table>

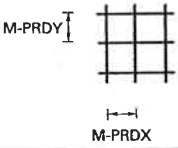
3. OPTION3

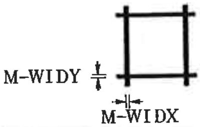
```
<OPTION 3 >

USX  =  ××× mm      MARGINL  =  ×××
  Y  =  ×××               R  =  ×××
ULX  =  ×××               T  =  ×××
  Y  =  ×××'              B  =  ×××
```

No.	Item	Description	Remarks
	US-X Y UL-X Y	Select it to register the size of the universal cassette; i.e., the size of copy paper to be loaded in the cassette. The operation enables the use of the auto reproduction ratio selection and paper selection mechanisms. US: US cassette UL: UL cassette X: paper feed direction Y: front/rear	Settings (CLC200/300): US-X: 190 to 279 Y: 190 to 279 UL-X: 317 to 354 L: 203 to 220 Setting (CLC350): US-X: 190 to 279 Y: 190 to 279 UL-X: 280 to 432 Y: 203 to 297 unit: 1 mm
	MARGIN-L R T B	Select it to adjust the margins. L: left R: right T: top B: bottom ● As a rule, do not change the standard settings.	Settings: 0 to 400 unit: 0.06 mm (approx.) standard: T = 126 L, R, B = 32

F. Test Print Mode (TEST PRINT)

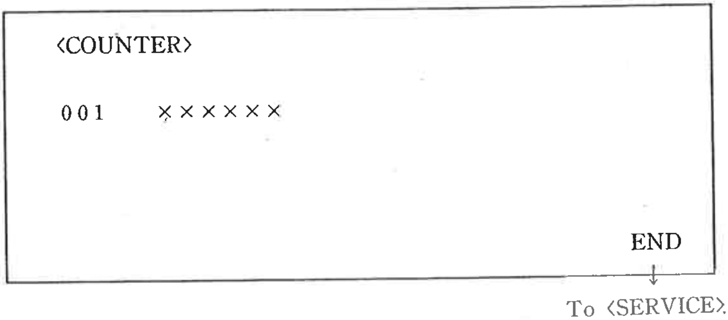
```
<TEST PRINT>
PGTYPE  = ××          M-PRDX  = ×××
DENS-Y  = ×××              Y  = ×××
     M  = ×××           WIDX  = ×××
     C  = ×××              Y  = ×××
     K  = ×××         H-WIDX  = ×××
                                      END
                                       ↓
                                 To <SERVICE>.
```

No.	Item	Description	Key operation
	PGTYPE	Select it to specify the type of test print. 0 : Image from the CCD (normal copying) 1 : MCYBk horizontal stripe (laser full power) 2 : 256 colors 3 : 256 gradations 4 : 16 gradations 5 : Half tone (full) 6 : Grid 7 : Reserved. 1 8 : Reserved. 2 9 : Reserved. 3 10: MCYBk horizontal stripe (laser FF power) 11: Reserved. 4 12: YMCBk 64 gradations 13: BGR 64 gradations 14: Full color 16 gradations (YMCBK) 15: Full color light area 16 gradations (YMCBK) 16: MCYBk horizontal stripe (laser A0 power); CLC300/350 only	▷: 0 to 16 OK: execute. COPY START key: execute (test printing). Specify output color 3, 4, 5, or 6 in the color mode under the user mode. ● Return it to 0 after test printing.
	DENS-Y M C K	Select it to specify the density of each color if in the following: PGTYPE = 5: Half tone (full)	0 to 255 ◁ , ▷ : select. standard: 128
	M-PRD-X Y	Select it to specify the size (intervals) of grids when PGTYPE = 6. 	0 to 255 0: 1/400 in. (0.06 mm) 255: 256/400 in. (16.26 mm) standard: 127

No.	Item	Description	Key operation
	M-WID-X Y	Select it to specify the size (intervals) of grids when PGTYPE = 6, 2, 3, 7, 8, 12, 13, 14, or 15.  	0 to 15 0: 1/400 in. (0.06 mm) 15: 16/400 in. (1 mm) standard: 0
	H-WID-X	Select it to specify the size (intervals) of grids when PGTYPE = 1 , 10 or 16 (horizontal stripe).	0 to 255 0: 1/200 in. (0.13 mm) 255: 256/200 in. (32.5 mm) standard: 128

G. Counter (COUNTER)

- Press the ∇ or Δ key to select the item.
- The reading will return to '000000' after '999999'.
- Press the C/⊘ key to clear the reading.
- Check the reading of '023' when the cleaning belt is replaced; if not '0', press the C/⊘ key to clear it.



〈COUNTER〉

001 ××××××

END

To 〈SERVICE〉

No.	Item	Description	No.	Item	Description
	001	Number of operations (Y developing assembly)		016	C, Bk copy counter
	002	Number of operations (M developing assembly)		017	Y, C, Bk copy counter
	003	Number of operations (C developing assembly)		018	M, C, Bk copy counter
	004	Number of operations (Bk developing assembly)		019	4C (YMCBk) copy counter
	005	Y copy counter		020	Total copy counter
	006	M copy counter		021	Number of scans (document scanner)
	007	R (YM) copy counter		022	Film projector copy counter
	008	C copy counter		023	Copy counter after NO BELT
	009	G (YC) copy counter		024	Number of pick-ups from lower cassette/paper deck
	010	B (CM) copy counter		025	Number of pick-ups from upper cassette
	011	3C (YMC) copy counter		026	Number of pick-ups from manual feed tray
	012	Bk copy counter		027	Number of pick-ups from RF tray of RDF
	013	Y, Bk copy counter		028	Number of pick-ups from DF tray of RDF
	014	M, Bk copy counter		029	Number of scans after cleaning primary corona wire
	015	Y, M, Bk copy counter			

H. Adjustments

1. Checking and Adjusting the Non-Image Width and Margin

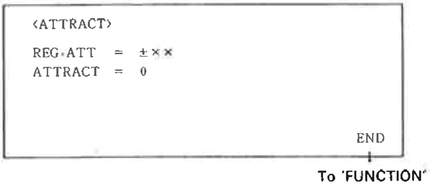
To make checks and adjustments, perform the following in the order named.

- Check the cassette holder and cassette.
- Adjust the point of attraction (ATTRACT).
- Check the setting for the margin (MARGIN-LRTB).
- Adjust the image read start position (ADJ-XY).
- Adjust the registration between the copy paper and image (IMG-REG).
- Check the margins.

a. Checking the Cassette Holder and Cassette

1) Make ten copies each by replacing cassettes, and check the copies for the left/right and top margins.
- Use the same cassette holder.
2) Check the side plates of the cassettes if the margins differ from cassette to cassette.
3) Make ten copies each using the upper and lower cassette holders, and check the left-right margins.
- Use the same cassette.
4) Adjust the position of the cassette holders if the margins differ between upper and lower holders.

b. Adjusting the Point of Attraction (ATTRACT)



```
<ATTRACT>

REG-ATT   =  ±××
ATTRACT   =  0



                              END
```

Figure 3-1105

1) Enter the service mode.
2) Press the ▽ key to select 'FUNCTION'.
3) Press the ▽ key to select 'ATTRACT'.
4) Press the ▽ key to move the cursor to 'ATTRACT', press the ▷ key to bring up 'ATTRACT=1', and press the OK key.
- A sheet of copy paper is picked up, attached around the transfer sheet, and stops.
5) Check the arrow printed on the transfer drum sheet and the position of the copy paper, and detach the copy paper.
6) Press the △ key to select 'REG-ATT'.
7) Perform the following:
- Increase the setting if, in step 5), a gap exists between the arrow and copy paper; or
- Decrease the setting if, in step 5), the arrow is hidden.
8) Turn the POWER switch ON and OFF when the adjustment is over.
- Otherwise, no image will be produced during normal copy operation.

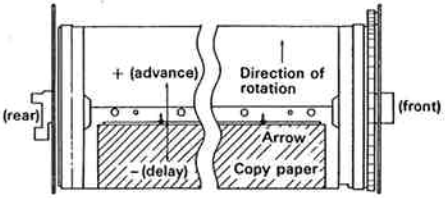
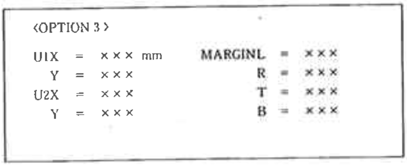


Figure 3-1106

c. Checking the Setting for the Margins (MARGIN-LRTB)

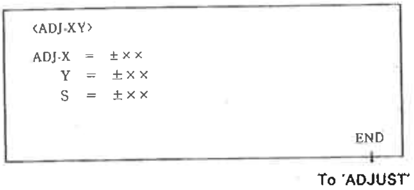


```
<OPTION 3>

U1X  =  ××× mm        MARGINL  =  ×××
  Y  =  ×××                 R  =  ×××
U2X  =  ×××                 T  =  ×××
  Y  =  ×××                 B  =  ×××
```

Figure 3-1107

1) Enter the service mode, and select 'OPTION'.
2) Press the ▽ key to bring up screen 'OPTION3', and check that the settings for 'MARGIN' are as follows:
   L (left): 32 (2 mm, approx.)
   R (right): 32 (2 mm, approx.)
   T (top): 126 (8 mm, approx.)
   B (bottom): 32 (2 mm, approx.)
3) Press the RESET key.

d. Adjusting the Image Read Start Position (ADJ-XY)



```
<ADJ-XY>
ADJ-X  =  ±××
    Y  =  ±××
    S  =  ±××
                                END
```

Figure 3-1108

1) Enter the service mode, and select 'ADJ-XY' of 'ADJUST'.
2) Press the COPY START key while the screen is displaying ADJ-XY.
- The copy modes will be set up automatically, and copies are made with a shift of about 50 mm as shown in Figure 3-1109.
3) Decrease the setting of 'ADJ-X, ADJ-Y', if any section of the image is missing.
4) Increase the setting of 'ADJ-X, ADJ-Y' if sections outside the image is copied.
5) Press the COPY START key, and make checks.
6) Press the RESET key.

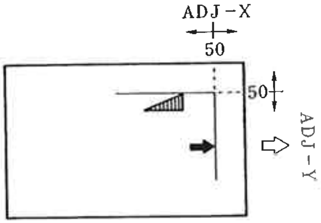
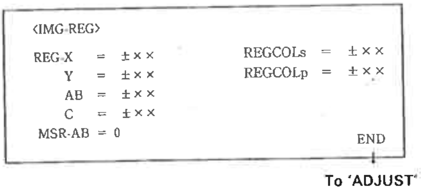


Figure 3-1109

e. Adjusting the Registration Between Copy Paper and Image (IMG-REG)



```
<IMG-REG>
REG-X   =  ±××          REGCOLs  =  ±××
    Y   =  ±××          REGCOLp  =  ±××
   AB   =  ±××
    C   =  ±××
MSR-AB  =  0                               END
```

Figure 3-1110

1) Set the copy count to '10'.
2) Enter the service mode, and select 'IMG-REG' of 'ADJUST'.
3) Press the COPY START key while the screen is displaying IMG-REG.
- The copy modes will be set up automatically, and ten copies are made with a shift of 50 mm.
4) Measure the distance between the edge of the image and that of the copy paper.
5) Decrease the setting of 'REG-X, REG-Y' if the average from the ten copies is 50 mm or more.
6) Increase the setting of 'REG-X, REG-Y' if the average from the ten copies is less than 50 mm.
7) Press the COPY START key once again, and make checks.
8) Press the RESET key.

■ Adjusting the Leading Edge Registration for OHP Sheets

1) Shift the manual feed lever down.
2) Enter the service mode, and select 'IMG-REG' of 'ADJUST'.
3) Make several OHP copies while keeping the IMG-REG screen displayed; you may use plain paper for the CLC350.
- The copy modes will be set up automatically, and copies are made with a shift of 50 mm as shown in Figure 3-1111.
4) Measure the distance between the edge of the image and that of the copy paper.
5) Decrease the setting of 'REG-C' if the average is 50 mm or more.
6) Increase the setting for 'REG-C' if the average is less than 50 mm.
7) Make copies on OHP sheets once again, and make checks.
8) Press the RESET key.

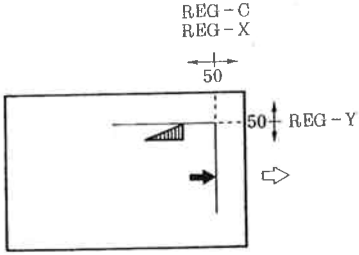
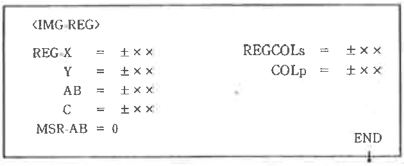


Figure 3-1111

f. Checking the Margin

1) Make ten copies, and check that the margin is within the standards.

2. Correction of Color Displacement (REG-COL) (CLC300/350 only)



```
<IMG REG>
REG X   = ±××          REGCOLs = ±××
    Y   = ±××             COLp = ±××
    AB  = ±××
    C   = ±××
MSR-AB  = 0
                                  END
```

To 'ADJUST'

Figure 3-31112

If displacement of the first color in the sub scanning (feeding) direction is conspicuous over the entire surface of the copy, adjust REGCOLs.

Make a single copy in each of the four colors several times, and obtain an average of displacement (M and others). Set the average under REGCOLs in units of 0.013 mm.

- If M has a delay compared to other colors, '+'; otherwise, '−'.
- Be sure to make these adjustments only after checking for an excessive load and checking the transfer drum.

Note:
To correct color displacement for normal copying operation, use REGCOLs. If the displacement occurs only when copying is from images on the IPU or of the test print, adjust REGCOLp.

3. After Replacement of Major Parts

a. After Replacement of Developer (YMCBk)

1) Select 'ATR-VR' of the service mode, execute 'STIR', and adjust the toner concentration VR.
2) Select 'ATR-INIT' to read in the toner concentration initial setting.

■ Steps 3) and 4) are for the CLC300/350 only.

3) Execute 'SLAT-ACT=1' under 'SALT'.
4) Execute 'INIT=K' once again if the black developer has been replaced.

b. After Replacement of Developing Assembly (YMC), Toner Concentration Sensor (YMC), or Color Toner Concentration Adjustment PCB

1) Replace the developer.
2) Select 'ATR-VR' of the service mode, execute 'STIR', and adjust the toner concentration VR.
3) Select 'ATR-INIT' to read in the toner concentration initial setting.

■ Steps 4) and 5) are for the CLC300/350 only.

4) Execute 'SALT-ACT=1' under 'SALT'.
5) Execute 'INIT=K' once again if the black developing assembly has been replaced.

c. After Replacement of Toner Concentration Sensor (Bk) or Black Toner Adjusting PCB

1) Clean the window of the toner concentration sensor.
2) Replace the black developer.
3) Execute 'STIR = K' of 'ATR-VR' in the service mode to adjust the black toner concentration VR.
4) Have the toner concentration initial value read in under 'ATR-INIT'.

■ Steps 5) and 6) are for the CLC300/350 only.

5) execute 'SALT-ACT=1' under 'SALT'.
6) Execute 'INIT=K' once again.

d. After Replacement of Photosensitive Drum Cleaning Unit

1) Apply lubricant on the cleaning blade.
2) Mount the photosensitive drum, and pour 5 g of lubricant into the cleaning unit.
3) Clean the window of the toner concentration sensor, and attach the drum unit.
4) Replace the black developer.
5) Select 'ATR-VR', and execute 'STIR = K', and adjust the Bk toner concentration VR.
6) Select 'ATR-INIT' to read in the Bk toner concentration initial setting.

■ Steps 7) and 8) are for the CLC300/350 only.

7) Execute 'SALT-ACT=1' under 'SALT'.
8) Execute 'INIT=K' once again.

e. After Replacement of DC Controller PCB

1) Relocate jumper connector J324.

f. After Replacement of Image Processor PCB

1) Select 'NEW-IP' of the service mode; clear the RAM, enter the back-up items, and perform 'W-SAMP'.

g. After Replacement of Laser Scanner, Laser Unit, or Laser Driver PCB

1) Perform 'laser power adjustment'.
2) Perform 'laser adjustment'.
3) Perform 'laser correction'.
4) Replace the black developer.
5) Select 'ATR-VR' of the service mode, and adjust the black toner concentration VR.
6) Select 'ATR-INIT', and read in the black toner concentration initial setting.

■ Steps 7) and 8) are for the CLC300/350 only.

7) Execute 'SALT-ACT=1' under 'SALT'.
8) Execute 'INIT=K' once again.

h. After Replacement of Lens Mount, Analog Processor PCB, Scanning Lamp, Lamp Regulator, Lamp Reflector, or Standard White Plate

1) Select 'CCD' of the service mode, and operate as necessary.

i. After Replacement of Transfer Drum

1) Enter the service mode, and make the following adjustments.

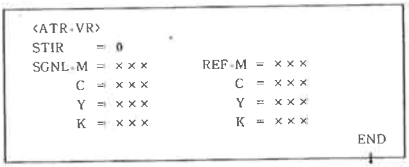
MSR-AB:	A/B side image signal automatic
REG-ATT:	leading edge point of attraction
REG-X:	leading edge registration
REG-C:	C side leading edge registration

Note:
For attaching the unit for the CLC300/350 to the CLC200, see SERVICE HANDBOOK.

4. Adjusting the Toner Concentration VR

- When the developer has been replaced, operate on only the developing assembly whose developer has been replaced.
- When the color toner adjustment PCB has been replaced, operate on the M, C, and Y developing assemblies.
- When the black toner adjustment PCB has been replaced, operate on the Bk developing assembly.
- Check that the four connectors in front of the developing assemblies are connected properly.

1) Enter the service mode, and select 'ATR-VR' of 'INSTALL' under 'FUNCTION'.



```
<ATR-VR>
STIR     =  0
SGNL-M   =  ×××          REF-M  =  ×××
     C   =  ×××              C  =  ×××
     Y   =  ×××              Y  =  ×××
     K   =  ×××              K  =  ×××
                                        END
```

To 'INSTALL'

Figure 3-1113

2) Press the ▷ key to select the developing assembly for which mixing is needed; 0, M, C, Y, Bk, 3C, and 4C in sequence
   3C: three colors (MCY)
   4C: four colors (MCYBk)
3) Press the OK key.
- The inside of the developing assembly will be stirred.
- The operation will stop automatically.

4) Press the ∇ key to select the VR to adjust.
   SGNL-M: VR904
   C: VR905
   Y: VR906
   K: VR981
   REF-K: VR982
- Adjust 'SGNL' only when developer has been replaced.
- 'REF-M, -C, -Y' may be left without adjustment.

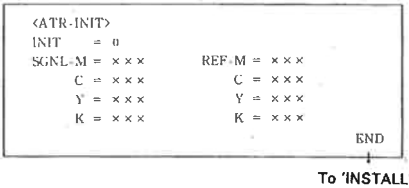
5) Press the OK key.
6) Wait for 15 seconds or more after the developing assembly has moved, and turn the VR until a continuous buzzer is heard: if no buzzer, turn it clockwise; if a buzzer at short intervals, turn it counterclockwise; if a continuous buzzer, end the adjustment.
7) Press the C/⊚ key.

Note:
In the case of the CLC200, a buzzer is sounded continuously when '204 ±3' to indicate that the adjustment is complete; in the case of the CLC300/350, 128 ±3 for SGNL-K and 204 ±3 for others.

5. Reading in the Toner Concentration Initial Setting

- When the developer has been replaced, operate only on the developing assembly whose developer has been replaced.
- When the color toner concentration adjustment PCB has been replaced, operate on the M, C, and Y developing assemblies.
- When the black toner concentration adjustment PCB has been replaced, operate only on the Bk assembly.
- To read in the K initial setting, mount the external covers, and close the front door before operation.
- Check that the four connectors in front of the developing assemblies are connected properly.

1) Select 'ATR-INIT' of 'INSTALL' under 'FUNCTION'.



```
<ATR-INIT>
INIT     = 0
SGNL-M = xxx        REF-M = xxx
     C = xxx            C = xxx
     Y = xxx            Y = xxx
     K = xxx            K = xxx
                                   END
```

Figure 3-1114

2) Press the ▷ key to select the developing assembly for which the initial setting is to be read in.
- 0, M, C, Y, Bk, K2, and K3 in sequence.
- Select 'K' when the black developer has been replaced.

3) Press the OK key.
- The SGNL and REF initial settings will be read in, and the operation will stop automatically.
- Record the settings on the service label.

Note (CLC300/350 only):
After the work, execute 'SALT-ACT=1' under 'SALT'; if the black developer has been replaced, execute 'INIT=K' a second time.

6. Adjusting the Laser Power

Adjust the laser power when the laser scanner, laser unit, or laser driver PCB is replaced.

Replace the black developer, adjust the black concentration VR, and read in the black toner concentration initial setting when 'laser power adjustment', 'laser adjustment,' or 'laser correction' has been performed.

Do not adjust VR501 but adjust VR502 only if the laser power has decreased because of a long period of use.

a. Tools
- Laser power checker (TKN-0198)
- Digital multimeter (CK-0436)

Note:
The output of the laser power checker is subject to change over time; send it to the service center for re-calibration after each year of use.

b. Adjustment
1) Turn the power OFF.
2) Remove the left cover, and open the image processor PCB.
3) Turn VR501 on the laser driver PCB counterclockwise and then VR502 clockwise until they turn idle.
4) Remove the screw near the hole for the laser power checker, and open the cover.
5) Insert the laser power checker into the hole.
6) Connect the lead wire of the laser power checker to the digital multimeter, and set the meter to the VDC range (200 mV).

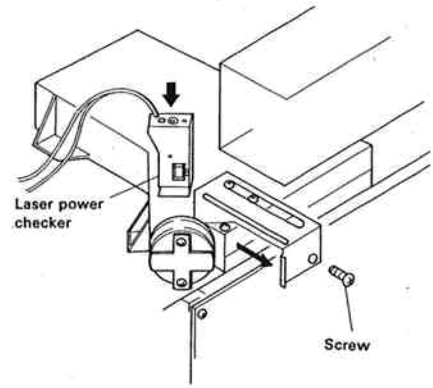
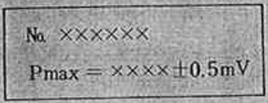


Figure 3-1115

7) Turn the power ON with the front door closed.
8) Enter the service mode, and select 'POWER' of 'LASER' under 'FUNCTION'.
9) Select 'POWER=1', and press the OK key.
10) Turn VR501 so that the setting is that shown on the laser unit label (Pmax).

> **Note:**
> i. The maximum setting is on the laser unit label; check it in advance.
>
> 
>
> No. XXXXXX
>
> Pmax = xxxx±0.5mV
>
> **Figure 3-1116**
>
> ii. Turn VR501 slowly while referring to the output of the laser power checker; take care so as not to increase the laser power in excess.
>
> iii. Take extra care so as not to go beyond the maximum value, over which the laser diode is subject to damage.

11) Turn VR502 until the following is true: 0.841 × Pmax ±0.5 mV
12) Press the C/⊗ key.
13) Perform 'laser adjustment'.

7. Laser Adjustment

Perform 'laser power adjustment' before performing 'laser adjustment'.

1) Select 'LASER'.
2) Select 'LASER=1', and press the OK key.
3) Turn VR504 until the following is true: 0.0085 × Pmax ±0.1 mV
4) Press the C/⊗ key.
5) Make adjustments the same way for 'LASER=2, 3, and 4' as shown in Table 3-1112.

LASER No.	VR	Standard (mV)
LASER = 1	504	0.0085 × Pmax ±0.05
LASER = 2	505	0.58 × Pmax ±0.5
LASER = 3	503	0.0085 × Pmax ±0.05
LASER = 4	506	0.58 × Pmax ±0.5

Table 3-1112

6) Perform 'laser correction'.

8. Laser Correction

Perform 'laser adjustment' and 'laser power adjustment' before performing 'laser correction'.

1) Select 'LASER=5', and press the OK key; record the output (mV) of the laser power checker. (1)
2) Select 'LASER=2', and press the OK key; record the output (mV) of the laser power checker. (2)
3) Perform the following calculation to obtain (3):

$$\frac{\text{output (1)}}{\text{output (2)}} \times 23.8$$

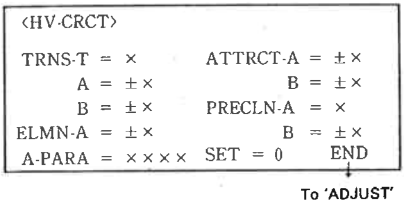
4) obtain the correction value by referring to Table 3-1113 press the ◁ or ▷ key to enter the value in 'TONE-PH=', and press the OK key.

Calculated value (3)	Correction value
11.4 or less	+10
11.5 to 11.9	+ 5
12.0 to 12.9	0
13.0 to 13.4	− 5
13.5 or more	−10

Table 3-1113

5) Press the RESET key to leave the service mode, and turn the power OFF.
6) Detach the laser power checker, and fix the cover over the hole in place.
7) Mount the image processor PCB.
8) Replace the black developer, adjust the black toner concentration VR, and read in the black toner initial setting.

9. Adjustment in 'HV-CRCT' of Service Mode



```
<HV-CRCT>

TRNS-T  =  ×        ATTRCT-A  =  ±×
     A  =  ±×              B  =  ±×
     B  =  ±×       PRECLN-A  =  ×
ELMN-A  =  ±×              B  =  ±×
A-PARA  =  ××××     SET  =  0     END
```

To 'ADJUST'

Figure 3-1117

If a horizontal black line is noted on copies made in the continuous mode, make checks and adjustments as discussed below; be sure to perform them only in the order named, i.e., a, b, c, and d.

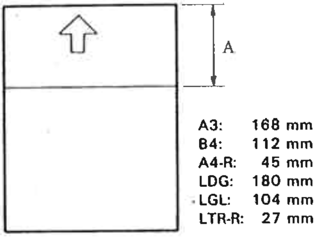


Figure 3-1118

a. Copy Paper
Use copy paper fresh out of package.

- If this corrects the problem, check place of paper storage.

b. Adjusting the Transfer High Voltage OFF Timing

1) Enter the service mode, and select 'HV-CRCT' under 'ADJUST'.
2) Press the ▷ key to increase the value of 'TRNS-T' by 1, attain 'SET = 1', and press the OK key.
3) Make copies in the continuous mode to see if the copies are free of horizontal lines.

- 'TRNS-T' may be 4 max.
- A high 'TRNS-T' can lead to transfer failure at the trailing edge of the copies; if this is the case, decrease the value by 1, and move on to c below.

c. Adjusting the Transfer High Voltage Output

1) Enter the service mode, and select 'HV-CRCT' under 'ADJUST'.
2) Check the setting of 'A-PARA' (environmental data).
less than 580 .... (1)
580 or more but less than
1050 .... (2)
1050 or more .... (3)
3) Decrease the setting of 'TRNS-A' if (1); decrease the setting of 'TRNS-B' if (2). If the horizontal line is still noted at – 4, decrease the setting of 'TRNS-A' keeping 'TRNS-B=-4'.
Decrease the setting of 'TRNS-B' if (3).

- Press the ▽ or △ key to select 'TRNS-A' or 'TRNS-B'.
- Press the ◁ key to attain 'SET = 1', and press the OK key.

4) Make copies in the continuous mode to see if the horizontal line is still noted.
TRNS-A .... – 7 to +7
TRNS-B .... – 4 to +7

- A lower TRNS-A or -B setting can lead to transfer failure (vertical white line) if this is the case, decrease the value by 1, and move on to d below.

d. Adjusting the Pre-Cleaning High-Voltage Output

1) Enter the service mode, and select 'HV-CRCT' under 'ADJUST'.
2) Check the setting of 'A-PARA' (environmental data).
less than 1050 .... (1)
1050 or more .... (2)
3) Increase the setting of 'PRECLN-A' if (1); increase the setting of 'PRECLN-B' if (2).

- Press the ▽ or △ key to select 'PRECLN-A' or 'PRECLN-B'.
- Press the ▷ key to attain 'SET = 1', and press the OK key.

4) Make copies in the continuous mode to see if the horizontal line is still noted.
PRECLN-A .... 0 to 4
PRECLN-B .... – 4 to +7

- A high PRECLN-A or -B setting can lead to cleaning failure.

I. Test Prints

The CLC 300 has eleven test print patterns to help identify the causes of image problems.

Note that if a problem on copies does not show on the test print, it is safe to assume that the cause is in the CCD, analog processor, or image processor.

1. Selecting the Test Print Pattern

Steps
1) Set the number of copies to make, size of the copy paper, and color modes*.
   * Effective if PGTYPE=3, 4, 5, 6.
2) Enter the service mode; press the ⧆ , ◁ or ▷ , and ⧆ keys.
3) Press the ▽ key to select OPTION4 or TEST PRINT, and press the OK key.
4) Press the ▷ key to select any of the modes under PGTYPE.
5) Press the COPY START key.

> **Note:**
> Be sure to return the setting of PGTYPE to '0' when checks are over.

Setting the Test Print Density (DENS-Y, M, C, K)

The mode is effective when test printing under PGTYPE=5 or =6.
1) Press the ▽ key to move the cursor to DENS-Y, M, C, or K; thereafter, press the ◁ key or ▷ key to set the density.

Setting the Grid Intervals ((M-PRD-X,Y)

The mode is effective when test printing under PGTYPE=6.
1) Press the ▽ key to move the cursor to M-PRD-X,Y; thereafter, press the ◁ or ▷ key to set the intervals.

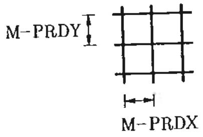


Figure 3-1119

Setting the Grid Width (M-WID-X,Y)

The mode is effective when test printing under PGTYPE=6, 2, 3, 7, 8, 12, 13, 14, or 15.
1) Press the ▽ key to move the cursor to M-WID=X, Y; thereafter, press the ◁ or ▷ key to set the width.

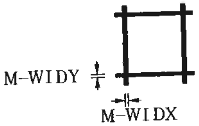


Figure 3-1120

Setting the Horizontal Stripe Width (H-WID-X)

This is available when testing PGTYPE=1, 10, or 16; 16 is for the CLC300/350 only.
1) Press the ▽ key to move the cursor to H-WID-X; thereafter, press the ◁ or ▷ key to set the width.

PGTYPE	Description
0	Image from CCD (normal copy operation)
1	MCYBk horizontal stripe (laser full power)
2	256 colors
3	256 gradations
4	16 gradations
5	Full half-tone
6	Grid
7 - 9	Reserved.
10	MCYBk horizontal stripe (laser FF power)
11	Reserved.
12	64 gradations (YMCBk)
13	64 gradations (BGR)
14	Full color 16 gradations (YMCBk)
15	Full color light scale 16 gradations (YMCBk)
16*	MCYBk horizontal stripe (laser A0 power)

*CLC300/350 only.

Table 3-1114

2. Horizontal Test Print (PGTYPE=1, 10, 16)

Use the horizontal test print to check the dark density of each color, balance among colors, and white lines in development.

a. Dark Density and Balance

No color on the copies should be conspicuously too light.

If any of the colors is too light, its developing assembly is likely to be faulty.

If all colors are too light, the laser system is likely to be faulty.

b. White Lines in Development

If such white lines are noted only on the cyan section of the copies, the cyan developing assembly is likely to be faulty.

c. Irregular Density Between Left and Right

If all colors suffer irregular density between left and right, the developing rolls or push-on block may be soiled or the height of the primary corona or transfer corona wire is not correct.

d. Image Location on Left and Right Sides

If the cassette holder is displaced or REG-X,Y is not correct, the copy paper and the image will not be aligned correctly, eliminating the non-image margin.

The condition can cause the toner to go astray, soiling the inside of the machine.

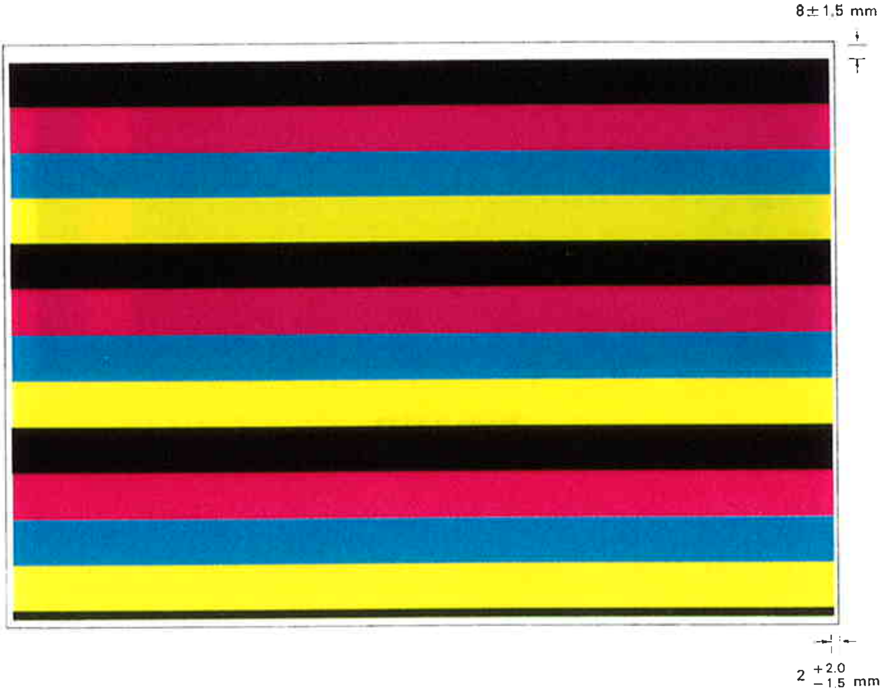


Figure 3-1121

3. 256-Color Test Print (PGTYPE=2)

Use the 256-color test print to check the tone of the colors.

Note that each group of 16×16 frames represents 256 colors; the representation is then repeated.

a. Tone of 256 Colors

Check that the tone shown in Figure 3-1122 is represented correctly.

If the tone has a discrepancy, the developer is likely to have deteriorated, the photosensitive drum is likely to have deteriorated, or developers are likely to have been mixed.

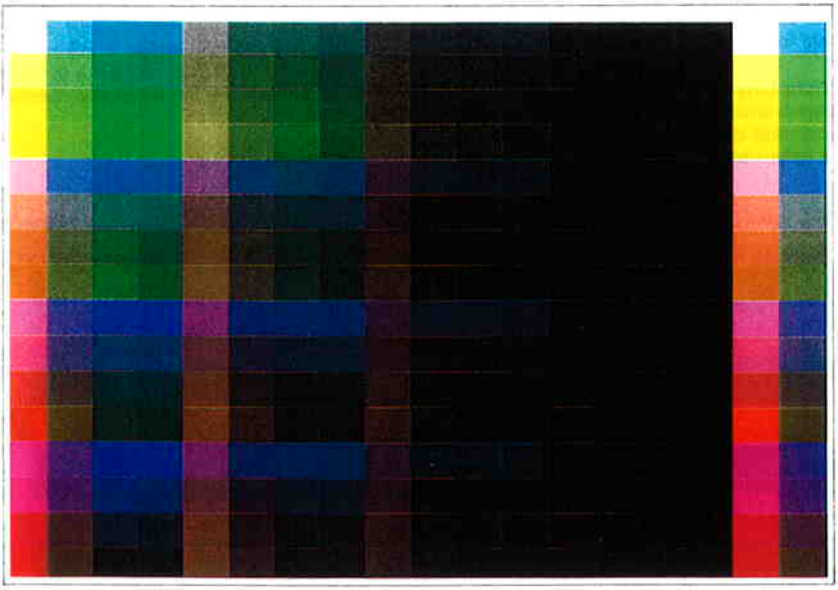


Figure 3-1122

4. 256-Gradation Test Print (PGTYPE=3)

Check the 256-gradation test print to check the reproduction of the gradation and balance among colors.

a. Gradation

The test print allows checks of all densities between 0 and 255.

b. Balance (3-color copy mode)

When the 3-color mode is selected and copies are made, the gray balance of densities between 0 and 255 can be checked.

Note:
Enter the user mode to select the mono-color or 3-color mode.

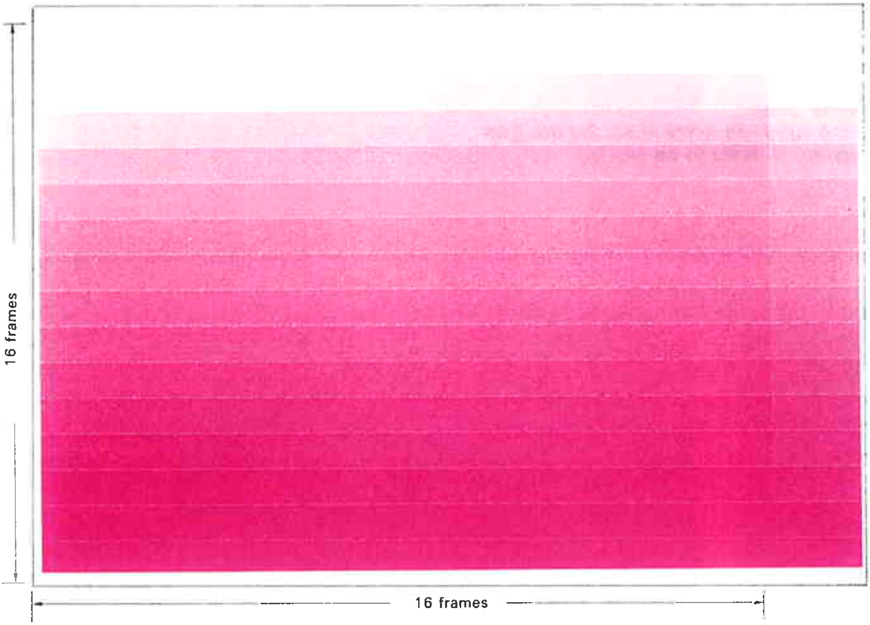


Figure 3-1123

5. 16-Gradation Test Print (PGTYPE=4)

Use the 16-gradation test print to check gradation, fogging, white lines, irregular density between left and right, and balance among colors.

a. Gradation

If the 16-gradation test print is not as shown in Figure 3-1124, the laser system is likely to be faulty.

b. Fogging

If fogging is limited to the white section (Figure 3-1124), the developing system or photosensitive drum is likely to be faulty, or the laser may not be correctly adjusted.

c. White Lines

If the copy has white lines, the developing system is likely to be faulty.

d. Irregular Density Between Left and Right

If the density is irregular between left and right, the developing rolls are likely to be worn or soiled, push-on block may be soiled, or height of the primary corona or transfer corona wire is likely to be wrong.

e. Balance Among Colors (3-color mode)

Select the 3-color mode when test printing to check the gray balance for each color.

Note:
Enter the user mode to select the mono-color or 3-color mode.

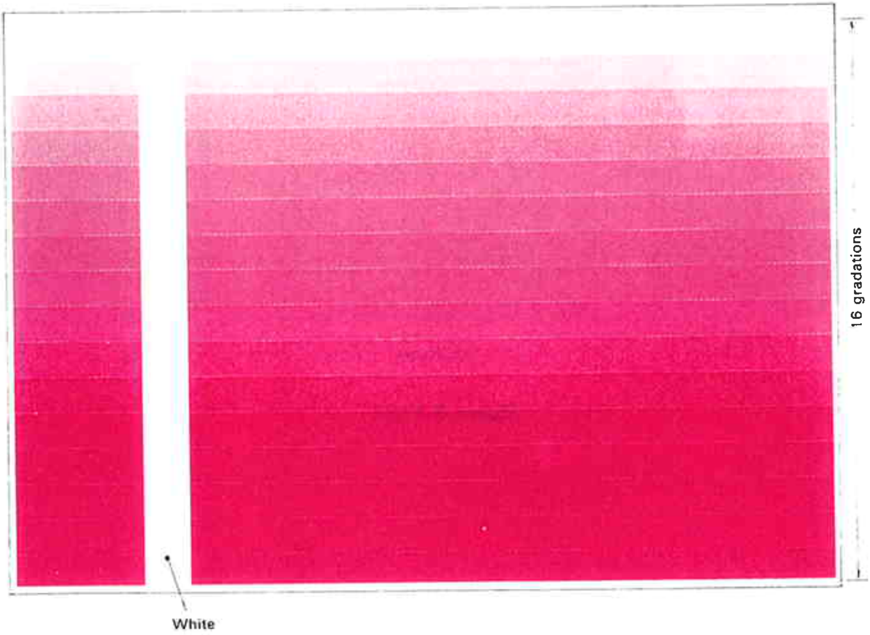


Figure 3-1124

6. Half-Tone Test Print (PGTYPE=5)

Use the half-tone test print to check transfer failure, black or white lines, and irregular pitch.

a. Transfer Failure

If transfer failure is noted, the transfer drum sheet, static eliminator, or push-on sheet is likely to be faulty.

b. Black Lines

If black lines are noted, the photosensitive drum is likely to have scratches or the primary corona unit is likely to be soiled.

c. White Lines

If a white line is noted at the same location for all colors, the transfer drum sheet or push-on sheet is likely to be faulty.

If it occurs at different locations or occurs for a single color, the developing assembly is likely to be faulty.

d. Irregular Pitch

If the copies have irregular pitch, the following is likely to be faulty:

- if at about 0.6mm pitch, the document scanner*;
- if at about 250 mm pitch, the photosensitive drum;
- if at about 35 mm pitch, the developing cylinder; and
- if at about 1.3 mm pitch, the registration roller drive gear.

* Not applicable to test prints.

Note:
Enter the user mode to select the mono-color or 3-color mode.

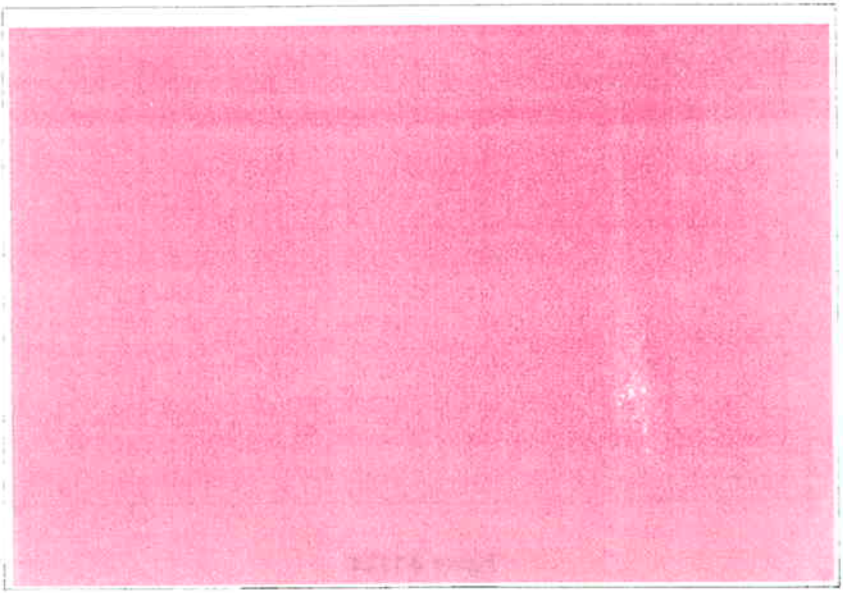


Figure 3-1125

7. Grid Test Print (PGTYPE=6)

Use the grid test print to check color displacement, angle, and lines.

a. Color Displacement

If color displacement is noted, the transfer drum sheet or push-on sheet is likely to be faulty.

Color displacement on the test print does not necessarily mean color displacement on actual copies, because of the black character (text) processing mechanism. As such, the condition is normal as long as the actual copies are free of color displacement. Use the test print to check the location and the color when actual copies suffer displacement.

b. Angle/Line

If angles or lines are not correct, the laser beam may be displaced or the BD is faulty.

Note:
Enter the user mode to select the mono-color or 3-color mode.

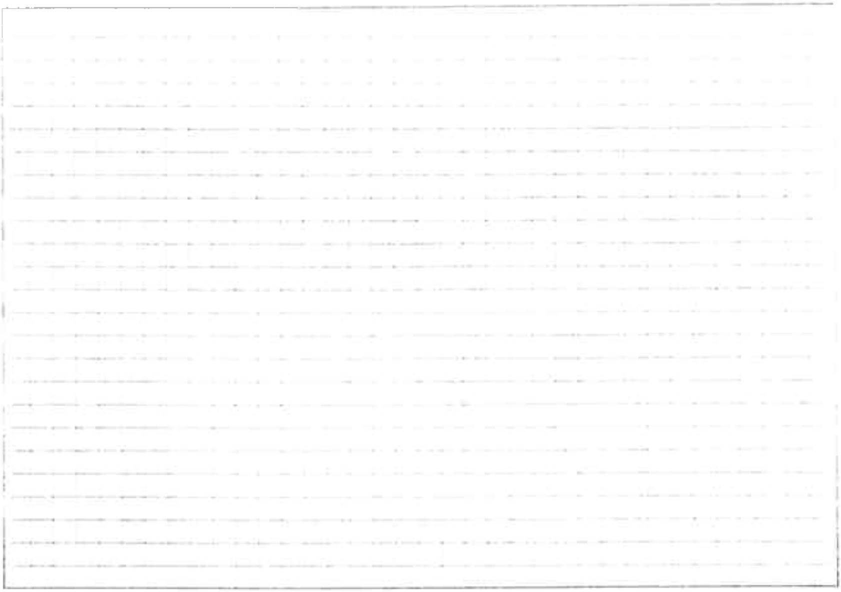


Figure 3-1126

8. 64-Gradation Test Print (YMCBk; PGTYPE=12)

Use the 64-gradation test print (YMCBk) to check the reproduction of gradation for Y, M, C, and Bk all at once.

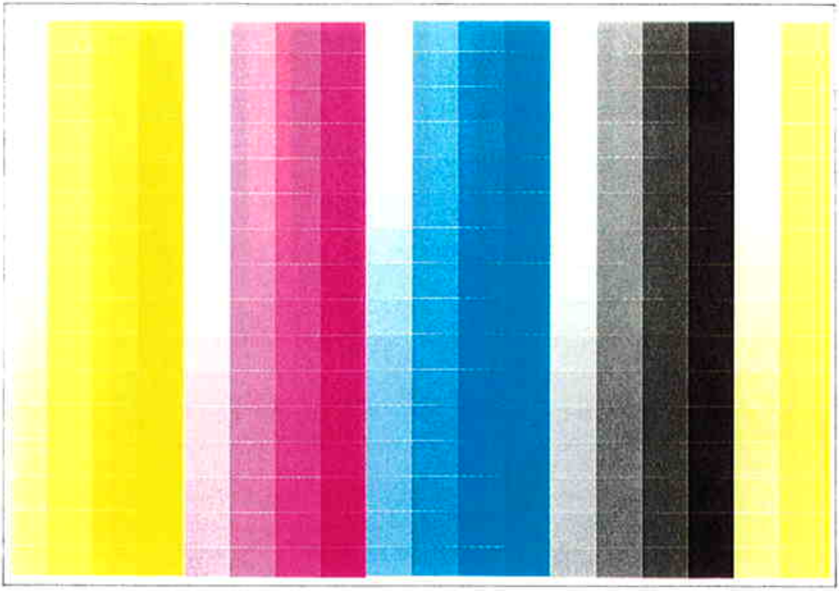


Figure 3-1127

9. 64-Gradation Test Print (BGR; PGTYPE=13)

Use the 64-gradation test print (BGR) to check the gray balance and gradation of B, G, and R in the 2-color mode.

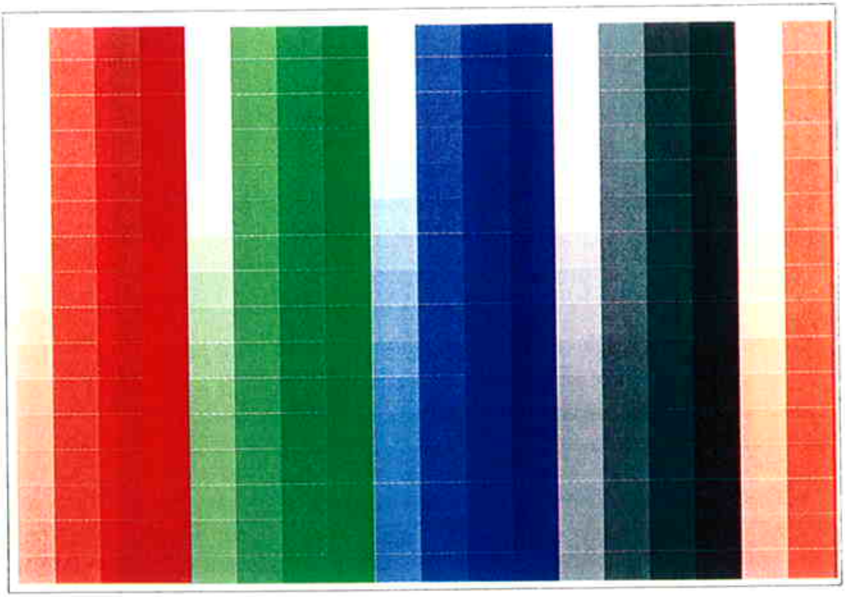


Figure 3-1128

10. Full Color 16-Gradation Test Print (YMC; PGTYPE=14; CLC200)

Use the full color 16-gradation test print (YMC) to check the gray balance, reproduction of gradation for Y, M, and C, and fogging.

a. Gray Balance

Check that each color is reproduced uniformly over the gray scale section; vary the contrast potential to make adjustments.

b. Gradation

Check the gradation and density differences among Y, M, and C.

c. Fogging

If fogging is noted on the white section, the developing system or photosensitive drum is likely to be faulty or the laser is not correctly adjusted.

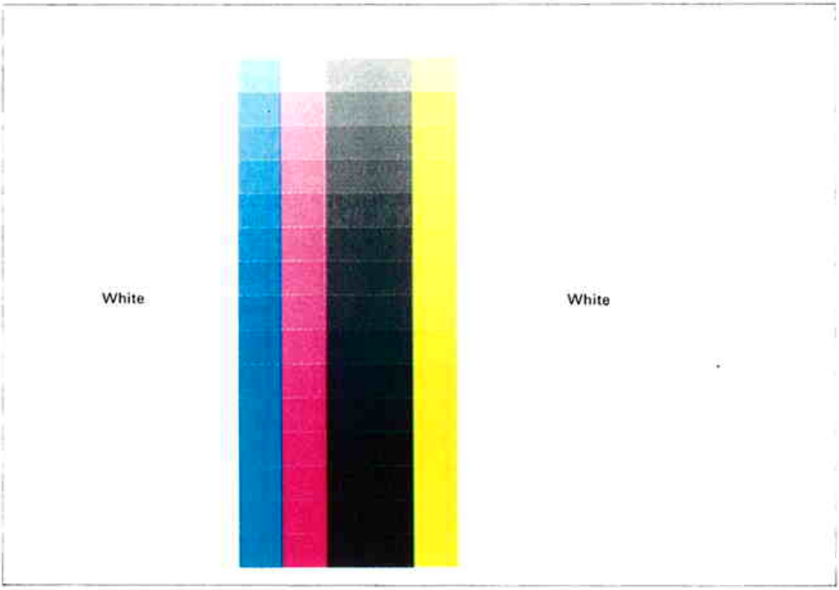


Figure 3-1129

10a. Full color 16-Gradation Test Print (YMCBk; PGTYPE=14; CLC300/350)

Use the full color 16-gradation test print (YMCBk) to check the gray balance, reproduction of gradation for Y, M, C, and Bk, and fogging.

a. Gray Balance

Check that each color is reproduced uniformly over the gray scale section; vary the contrast potential to make adjustments.

b. Gradation

Check the gradation and density differences among Y, M, C, and Bk.

c. Fogging

If fogging is noted on the white section, the developing system or photosensitive drum is likely to be faulty or the laser is not correctly adjusted.

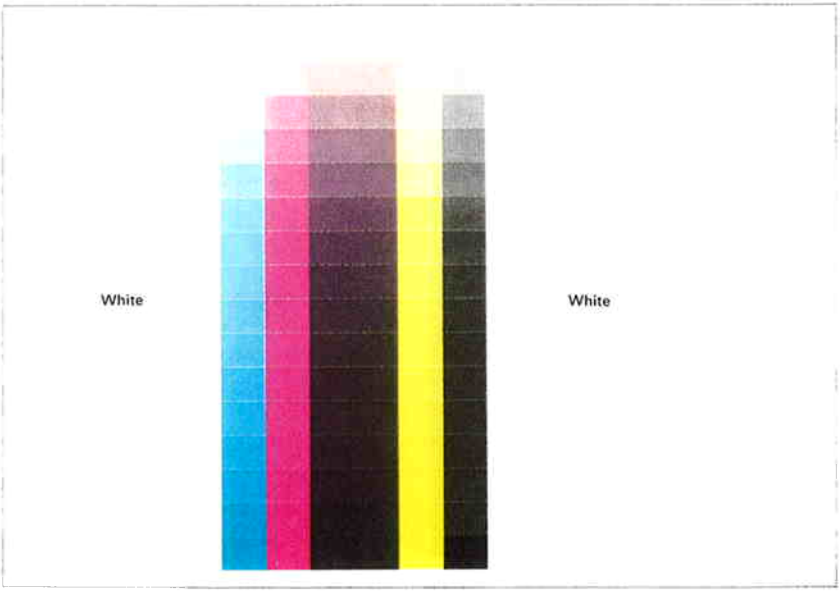


Figure 3-1129a

11. Full color 16-Gradation Test Print (YMCBk; PGTYPE=15; CLC200)

This test pattern allows better checks on the gradation of Y, M, and C and gray balance on light sections than patterns under PGTYPE=14.

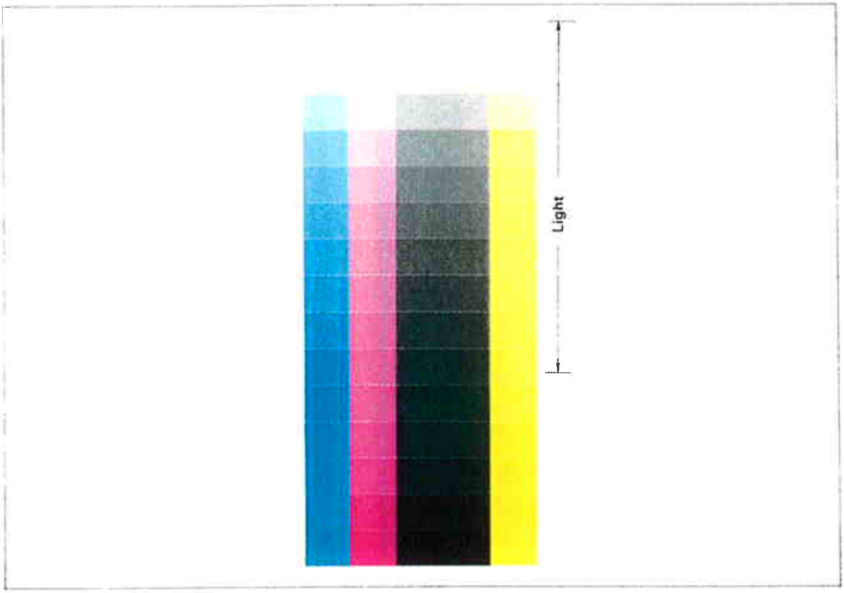


Figure 3-1130

11a. Full color 16-Gradation Test Print (YMCBk; PGTYPE=15; CLC300/350)

This test pattern allows better checks on the gradation of Y, M, C, and Bk and gray balance on light sections than patterns under PGTYPE=14.

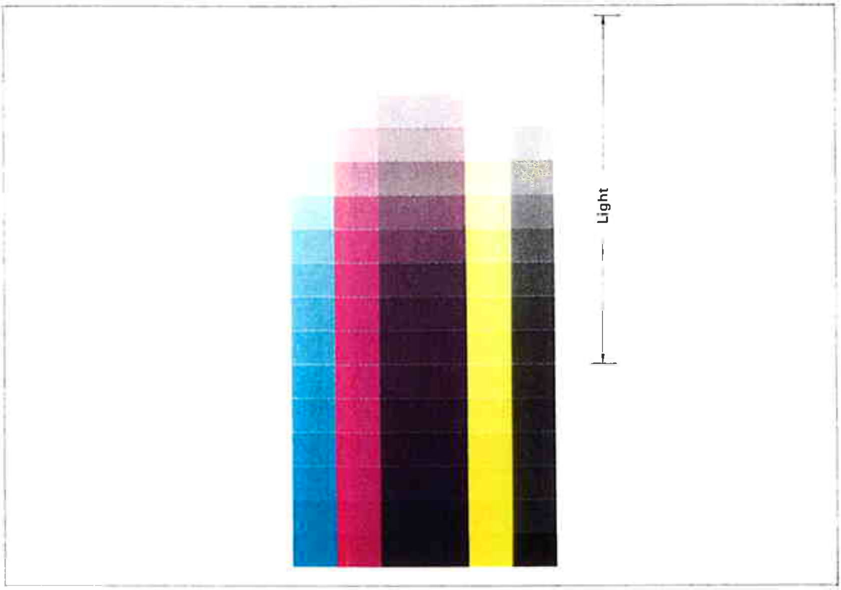


Figure 3-1130a

XII. SELF DIAGNOSIS

The CLC200/300/350 is eqiupped with a mechanism that checks the condition of the machine (sensors); the functions are executed by the image processor and the microprocessor of the DC controller, and errors are indicated on the control panel in the form of codes. are indicated on the control panel in the form of codes.

See Table 3-1200 for the details of each error code; checks may be made under 'JAM/ERROR' of the service mode.

Code	Cause	Description	
E000	• Fixing thermistor (TH1; shorting) • SSR (shorting) • DC controller PCB (failure)	0001	The temperature remains 169 (170)°C or more for a period of 0.5 sec or more.
	• Fixing thermistor (TH1; poor contact or open circuit) • Fixing heater (H1, H2; open circuit) • SSR (failure) • DC controller PCB (failure) *On the right rows, values in parentheses represent the temperature of the fixing roller actually measured.*	0002	The temperature is 74 (100)°C or less when the POWER switch is turned ON and does not reach 143 (150)°C within 20 min.
		0003	The temperature is 74 (100)°C or more when the POWER switch is turned ON and does not reach 143 (150)°C within 10 min.
		0004	The temperature is 123 (130)°C or less after it has reached the specified value.
E005	• Cleaning belt (inside the fixing assembly has been taken up) • Cleaning length sensor (PS8; failure) • DC controller PCB (failure)	The cleaning belt solenoid has gone ON 270 times after the belt length sensor has detected the lever.	
E010	• Drum drive system (over-load) • Drum motor (M2; failure) • DC controller PCB (failure)	The drum motor ready signal (DRMRDY✻) remains '1' for 0.1 sec or more when the drum motor is rotating.	
E012	• Main motor drive system (over-load) • Main motor (M1; failure) • DC controller CPB (failure)	The main motor ready signal (MMRDY✻) remains '1' for 0.1 sec or more when the main motor is rotating.	
E020	See below.	Toner Concentration (×× is color of toner) ××=01: M ××=02: C ××=03: Y ××=04: Bk SGNL: toner density signal REF: reference signal	
	• Toner concentration sensor (failure) • Toner concentration adjusting PCB (failure)	××01	SGNL is 0 or 255, and the condition lasts continuously for 40 copies.
		××02	REF is 16 or less or 240 or more.

Table 3-1200A

* The reading under 'DENS' of DENS/VCONT (service mode).

Code	Cause		Description
E020	• Back-up data (image processor PCB; enter the value shown on the service label)	××03	The initial value of SGNL of the image processor PCB is 16 or less or 240 or more. In the case of the CLC300/350, BK (403) is 5 or less or 200 or more; however, if ATR-SNS=0, 16 or less or 240 or more.
		××04	The initial value of REF of the image processor PCB is 16 or less or 240 or more.
	• Toner supply (late) • Developer (deterioration) • Hopper (failure)	××05	SGNL is -3.2% (Note 1) or less in relation to the initial value of SGNL, and this condition lasts for continous 20 copies.
	• Toner supply (excessive) • Hopper (failure)	××07	SGNL is +3.2% (Note 1) or more in relation to the initial value of SGNL, and the condition lasts for continuous 20 copies.
	• Toner concentration sensor (failure) • Toner concentration adjusting PCB (failure)	××08	The difference between the initial value of REF and REF is 50 or more.
		××14	The value of REF is 0.
	• Back-up data error (image processor PCB; be sure to clear the RAM, and enter the value from the service label)	××15	The value of RATE* stored into the image processor PCB is 0. *The coefficient that determines the amount of toner to be supplied to compensate for the fluctuations in SGNL; adjustment is not possible in the field.
	• Developing assembly (poor stirring of developer) • Toner concentration sensor (failure) • Toner concentration sensor adjusting PCB (failure) • Sensor (light infiltration; no cover or front door open; Bk only) • Photosensitive drum (deterioration Bk only)	××16	The initial values of SGNL have a discrepancy of 16 or more at time they are read.
		××17	The initial values of REF have a discrepancy of 16 or more at time they are read.
		××18	The initial value of SGNL is 16 or less or 240 or more at time it is read. • In case of the CLC200, BK (0418) is 20 or less or 160 or more. • In case of the CLC300/350, BK (0418) is 5 or less or 100 or more, but 20 or less or 160 or more if ATR-SNS=0.
	• Toner concentration sensor (failure) • Toner concentration adjusting PCB (failure)	××19	The initial value of REF is 16 or less or 240 or more at time it is read.

Note 1: The reading under 'DENS' of DISPLAY3 or DENS/VCONT (service mode).

Table 3-1200B

Code	Cause	Description	
E020	• Black toner concentration sensor (dirt or scratch on window) • Photosensitive drum (dirt; cleaning failure)	0420	The correction value for dirt is 60% or less. • No check if ATR-SNS=0.
	• Black toner concentration sensor (stray light; no cover, front door open) • VR981 (SGNL-K of ATR-VR; faulty adjustment; e.g., 204±3 instead of 128±3)	0421	The correction value for dirt is 150% or more. • No check if ATR-SNS=0.
	• Back toner concentration sensor	0422	The correction value for dirt is 0% • No check if ATR-SNS=0.
	• Back-up data error (image processor PCB; be sure to clear the RAM, and enter the value from the service label)	××23	The sensor correction coefficient (SALT-M, -C, Y, -K) is 0. • No check if ATR-SNS=0 or SALT-ON=0.
	• Developer (deterioration) • Developing cylinder (rotation fault) • Developing assembly (engagement fault)	××24	The solid density under SALT control is below a specific level.
E021	• Developing assembly position sensor (PS6; failure) • Developing assembly shift system (over-load) • Developing assembly shift motor (M4; failure) • Developing assembly shift motor driver PCB (failure)	0002	The developing assembly position sensor is '0' (OFF) when it stops at the point of development (M, C, Y, Bk) or when it moves away from it.
	• Developing assembly shift base home position sensor (PS5; failure) • Developing assembly shift system (over-load) • Developing assembly shift motor (M4; failure) • Developing assembly shift motor driver PCB (failure)	0004	The home position search does not end within the specified time. • 5 sec if the search is from the home position. • 10 sec if the search is from a point other than the home position.
	• Developing assembly position sensor (PS5; failure) • Developing assembly shift motor driver PCB (failure)	0005	The developing assembly sensor is '1' (ON) when the home position search ends.
	• Wiring, Connector (faulty) • Developing assembly drive motor driver PCB (faulty)	5551 5552 5553	An error has occurred in the communication between the developing assembly drive motor driver PCB and the DC controller PCB.
E022	• DC power supply (to developing assembly motor driver PCB) • Wiring, connector (failure) • Developing assembly shift motor driver PCB (failure) • DC controller PCB (failure)	The communication between the developing assembly shift motor driver PCB and DC controller PCB fails for 5 sec or more.	

Table 3-1200C

Code	Cause	Description	
E023	• Developing cylinder drive system (over-load) • Developing cylinder motor (M6; failure) • DC controller PCB (failure)	The developing cylinder motor drive circuit of the DC controller PCB detects an over-current, and the condition remains for 1 sec or more.	
E030	• Counter (open circuit) • J324 (jumper connector) • DC controller PCB (failure)	• Check the counter to see if it goes ON and OFF; normal if the counter drive signal is '0' when the counter goes ON; normal if the counter drive signal is '1' when the counter goes OFF. • The counter mode switching jumper connector (J324) may have failed, i.e., J324-1 and -3 are both '1' or '0'.	
E040	• Upper cassette lifter limit sensor (PS11) • Lower cassette lifter limit sensor (PS12) • Upper cassette lifter clutch (CL10) • Lower cassette lifter clutch (CL11) • Lifter drive system (over-load) • DC controller PCB (failure)	The lifter limit sensor does not go ON within 4 sec after the cassette lifter clutch goes ON.	
E061	• Potential measuring unit (failure) • Primary corona unit (failure) • HVDC (failure) • DC controller PCB (failure) • Laser unit (failure) • Laser shutter (failure) • Pre-exposure lamp (failure) • Environment sensor (failure) • Photosensitive drum (failure) • Grounding (photosensitive drum)	Potential Control Failure ××=01: M ××=02: C ××=03: Y ××=04: Bk	
		0001	• V_D2 is less than V_D1. • V_D2 and V_D1 are different by 50 V or less.
		0002	• V_D3 is less than V_D2. • V_D3 and V_D2 are different by 50 V or less.
		0003	• V_D1 is less than V_L1. • V_D1 and V_L1 are different by 50 V or less.
		0004	• V_D2 is less than V_L2. • V_D2 and V_L2 are different by 50 V or less.
		0005	• V_D3 is less than V_L3. • V_D3 and V_L3 are different by 50 V or less.
		0006	V_D2 and V_L2 are different by a value smaller than the difference between V_D1 and V_L1.
		0007	V_D3 and V_L3 are different by a value smaller than the difference between V_D2 and V_L2.

Table 3-1200D

Code	Cause	Description	
E061	• Potential measuring unit (failure) • Primary corona unit (failure) • HVDC (failure) • DC controller PCB (failure) • Laser unit (failure) • Laser shutter (failure) • Pre-exposure lamp (failure) • Environment sensor (failure) • Photosensitive drum (failure) • Grounding (photosensitive drum)	××01 ××02	The grid bias lower limit (200 V) has been checked.
		××03 ××04	The grid bias upper limit (900 V) has been checked.
		××05 ××06	VD is less than the fog eliminating potential (Vback).
		××07 ××08	VD and Vback are different by a value smaller than the lower limit.
		××09 ××10	VD and Vback are different by a value greater than the upper limit (800 V).
E062	• Drum thermistor (TH2; shorting, open circuit) • Drum heater (H3; failure) • SSR (failure) • Developing assembly shift motor driver PCB (failure)	• The temperature reaches the specified value and, thereafter, drops to 25°C or less. • The temperature rises to 50°C or more.	
E070	• A-side sensor (PS4; failure) • DC controller PCB (failure)	The A-side sensor does not go '1' (ON) within 10 sec after the drum motor goes ON.	
E071	• Image leading edge sensor (PS3; failure) • Drum motor drive system (over-load) • DC controller PCB (failure)	• The image leading edge sensor does not go '1' (ON) within 4 sec after the drum motor goes ON. • The period between when the sensor goes ON and it goes ON next time is 4 sec or more.	
E072	• Transfer drum cleaner drive system (over-load) • Transfer drum cleaner motor (M7; failure) • DC controller PCB (failure)	The transfer drum cleaner motor drive circuit of the DC controller PCB detects an over-current, and the condition remains for 1 sec or more.	
E100	• Laser unit (failure) • BD mirror (displacement) • Optical fiber (failure) • Laser driver PCB (failure) • Image processor PCB (failure)	The cycles of the BD signal has a discrepancy of 0.05 sec or more during image exposure.	
E110	• Laser scanner drive system (over-load) • Laser scanner motor (M3; failure) • DC controller PCB (failure)	The laser scanner motor ready signal (LSMRDY✱) remains '1' for 0.1 sec or more while the laser scanner motor is rotating.	
E120	• Laser thermistor (TH3; shorting, open circuit) • Laser heater (H4; failure) • Developing assembly shift motor driver PCB (failure)	• The temperature does not reach the specified value (45°C) within 10 min after the POWER switch is turned ON. • The temperature drops to 40°C or less after it has reached the specified value (45°C). • The temperature rises to 50°C or more after it has reached the specific value (45°C).	

Table 3-1200E

Code	Cause	Description
E191	• DC controller PCB (failure)	The communication between the main CPU and high-voltage microprocessor (D/A converter) on the DC controller PCB fails for 1 sec or more.
E192	• DC controller PCB (failure)	The communication between the main CPU and A/D converter on the DC controller PCB fails for 1 sec or more.
E208	• DC power supply (to document scanner PCB) • Wiring, connector (failure) • Document scanner motor driver PCB (failure) • Image processor PCB (failure)	The communication between the document scanner motor driver PCB and image processor PCB fails for 5 sec or more.
E305	• Image processor PCB (failure) • Film projector I/F PCB (failure) • Image editing unit I/F PCB (failure) For sub-codes, see Table 7-1200G	• The access to RAM on the image processor PCB fails at time the POWER switch is turned ON. • The access to RAM on the film projector I/F PCB or image editing unit I/F PCB fails; 'E305' is indicated when the COPY START key is pressed in the projector or area specification mode.
E350	• Standard white plate fault • Image processor PCB fault	During the 1st copy after the power is turned ON.
E351	• Image processor PCB fault • ECO processor PCB fault • Connection fault among image processor, ECO processor and laser driver	• When the ECO processor PCB and image processor PCB have not been connected. • When the ROM combination on the ECO processor PCB is not correct.
E352	Standard white plate	WSMP of the service mode is being executed.
E353	• White density calibration plate fault • White paper fault	• When damage or staining of the white density calibration plate is found while WSMP of the service mode is being executed. • When the density of the white paper set on the copyboard glass is found to be too great while WSMP of the service mode is being executed.
E400	• DC power supply (to RDF) • RDF controller PCB (failure) • Image processor PCB (failure)	• The communication between the RDF and image processor PCB fails for 5 sec or more.
E401	• Pick-up motor (RF-3; failure)	See the RF-3 SERVICE MANUAL.
E402	• Belt motor (RF-3; failure)	See the RF-3 SERVICE MANUAL.

Code	Cause	Description
E403	• Feed motor (RF-3; failure)	See the RF-3 SERVICE MANUAL.
E405	• Pick-up motor clock sensor (RF-3; failure)	See the RF-3 SERVICE MANUAL.
E411	• Sensor (RF-3; failure	See the RF-3 SERVICE MANUAL.
E620	• Image editing unit controller PCB (failure) • Image editing unit controller I/F PCB (failure) • Image processor PCB (failure)	The communication between the image editing unit and image processor PCB fails for 5 sec or more.
E633	• Film projector controller PCB (failure) • Film projector I/F PCB (failure) • Image processor PCB (failure)	The communication between the film projector and image processor PCB fails for 5 sec or more.
E634	• Projector lamp (failure)	See the PROJECTOR SERVICE MANUAL.
E660	• IC card unit (failure) • Image processor PCB (failure)	The communication between the IC card unit and image processor PCB fails for 5 sec or more.
E700	• DC power supply (to DC controller PCB) • DC controller PCB (failure) • Image processor PCB (failure)	The communication between the DC controller PCB and image processor PCB fails for 5 sec or more.

Table 3-1200F

Sub-code	Cause	Sub-code	Cause
0001	BD error (same as E100)	0800, 1000, 2000, 4000, 8000	RAM error on IPU interface PCB
0002	RAM (concentration conversion) error		
0004	RAM (B shading correction) error		
0008	RAM (G shading correction) error	F800	IPU interface PCB not connected
0010	RAM (R shading correction) error	FC00	Projector interface PCB and IPU interface PCB not connected
0020	RAM (color correction) error		
0040	Scanner motor error	FB00	Editor interface PCB and IPU interface PCB not connected
0100 0200	RAM (on editor interface PCB) error	FF00	Editor interface PCB and projector interface PCB not connected
0400	RAM (on projector interface PCB) error		
0100, 0200	RAM error on editor interface PCB or PCB not connected		
0400	RAM error on projector interface PCB or PCB not connected		

Table 3-1200G E305

Note:

i. To reset the machine after the self diagnosis mechanism has been activated, turn the POWER switch OFF and ON again. In the case of 'E000', however, this operation will not work; this consideration is to prevent heating of and, as a result, damaging to the fixing roller.

ii. In the case of 'E005', i.e., no cleaning belt , replace the belt and clear '023' of 'COUNTER' in the service mode.

iii. The most recent error code can still be checked under 'DISPLAY8' or 'JAM/ERROR' of the service mode after resetting the machine.

Resetting 'E000'

1) Enter the service mode, and select 'F-MISC' or 'F-MISCp' of 'FUNCTION'.
2) Press the ∇ key to select 'E000-RLS'.
3) Press the ▷ key to select 'E000-RLS = 1', and press the OK key.
4) Turn the POWER switch OFF and ON.

Clearing '023' of 'COUNTER'

1) Enter the service mode, and select '023' of 'COUNTER'.
2) Press the C/▽ key.
3) Press the RESET key.

CHAPTER 4

MECHANICAL SYSTEM

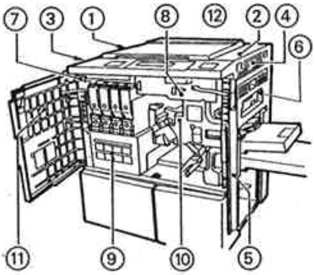
1. ⚠ CAUTION: Before serving a copying machine, disconnects its power cord from the electrical outlet.
2. Group the screws by type (length and diameter) and location.
3. The fixing screw for the grounding wire and varistors is fitted with a washer to ensure electrical conductivity; be sure to use the washer for reassembly.
4. One of the mounting screws of the rear cover is fitted with a washer to protect against static electricity; be sure to use the washer for reassembly.
5. If possible, avoid operating the printer with any of its parts removed.
6. Unless otherwise noted, reassembly is the reverse of disassembly.

7. The left door switch goes OFF and, at the same time, the laser shutter closes as soon as the front left door is opened; as such, put the door switch actuators into the left door switch and laser shutter if the machine needs to be operated with its front left door open. DO NOT BLOCK THE LASER PATH WITH LIGHT REFLECTING OBJECTS.
8. When the CLC300/350 is switched ON, SALT control starts automatically after initial rotation to move the developing assemblies. Keep this in mind to avoid injuries when making checks.

I. EXTERNALS 4-1
  A. External Covers 4-1
  B. Fans and Blowers 4-5
II. DRIVE SYSTEM 4-9
  A. Drive Chain Layout 4-9
  B. Drum Motor 4-9
  C. Main Motor Drive Unit 4-12
  D. Transfer Drum Cleaner Unit 4-13
  E. Fixing Assembly/Feeder Unit Drive Unit 4-13
III. FEEDER SYSTEM 4-15
  A. Pick-Up Unit 4-15
  B. Feeder Unit 4-25
  C. Transfer Drum Unit 4-26
  D. Lower Feeder Unit 4-42
IV. SCANNING SYSTEM 4-43
  A. Scanning System 4-43
V. CORONA SYSTEM 4-52
  A. Photosensitive Drum Unit . 4-52
  B. Corona Units 4-63
VI. DEVELOPING SYSTEM 4-67
  A. Developing Assembly 4-67
  B. Hopper Unit 4-84
VII. FIXING SYSTEM 4-87
  A. Fixing Assembly 4-87
  B. Fixing Assembly Cleaner Unit 4-93
  C. Delivery Unit 4-95
  D. Oil Application Unit 4-95
VIII. OPTIONS 4-97
  A. Removing the Offset Tray . 4-97
  B. Removing the Image Editing Unit 4-98
  C. Removing the Paper Deck 4-98

I. EXTERNALS

A. External Covers



① Rear cover (4)
② Upper cover (8)
③ Left cover (2)
④ Upper right cover (2)
⑤ Front right door (1)
⑥ Rear right cover (2)
⑦ Counter cover (2)
⑧ Inside right cover (3)
⑨ Hopper cover (2)
⑩ Transfer drum cover (2)
⑪ Front left door (1)
⑫ Front right cover (1)

Figure 4-100

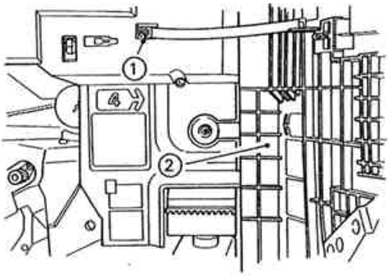
Note:
The numbers in parentheses refer to the number of mounting screws used; use a toothed washer for the screw (right) when mounting the rear cover.

Remove the covers as necessary for cleaning, inspecting, or repairing the inside of the machine.

Covers that can be detached by mere removal of the screws are left out of the procedure.

1. Inside Right Cover

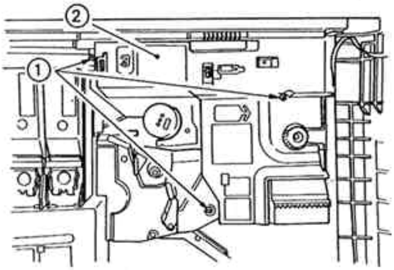
1) Remove the screw (w/ washer) from the front right door.



① Screw
② Front right door

Figure 4-101

2) Remove the three screws, and remove the inside right cover.

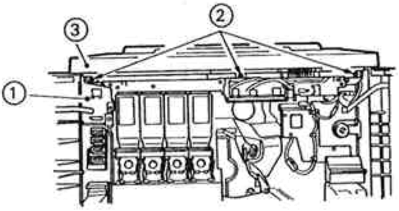


① Screws
② Inside right cover

Figure 4-102

2. Removing the Control Panel

1) Remove the inside right cover and counter cover.
2) Loosen the three screws that hold the control panel in place, and open the control panel holding its front side.

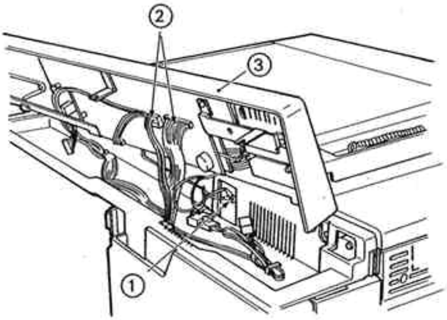


① Counter cover ③ Control panel
② Screws

Figure 4-103

Note:
The control panel has connectors and harnesses connected to its back; do not force the control panel open at this point.

3) Remove the screw (GND; 2 wires), and disconnect the two connectors (JCP1, 40P; JCP2, 4P) from the control panel.



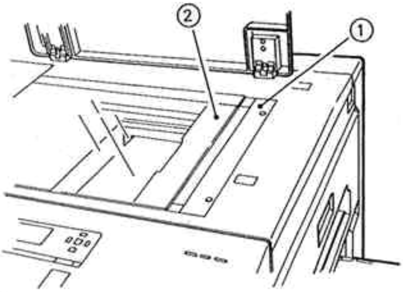
① Screw (GND) ③ Control panel
② Connectors

Figure 4-104

4) Remove the control panel.

3. Removing the Copyboard Glass

1) Remove the two screws, and remove the copyboard glass retainer (right).



① Copyboard glass retainer (right) ② Copyboard glass

Figure 4-105

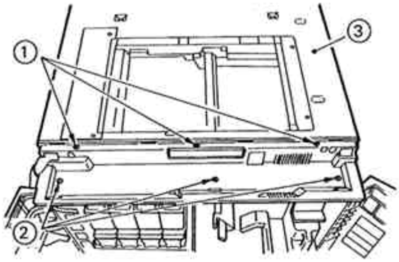
Note:
Take care not to drop the washer fitted to the screw at the rear.

2) Lift the right end of the copyboard glass, and remove the copyboard glass.

Note:
Do not remove parts other than the copyboard glass retainer (right) when removing the copyboard glass; when mounting it, on the other hand, keep the copyboard glass against the rear left and fix it, taking care so that it will not override the stop plate.

4. Removing the Upper Cover

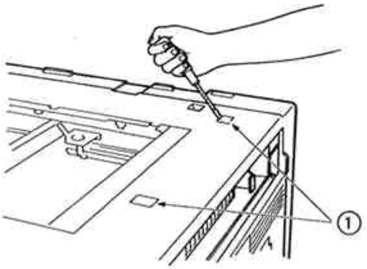
1) Remove the copyboard cover.
2) Remove the size plate (left); see Figure 4-400.
3) Remove the copyboard glass retainer (right); two screws.
4) Remove the copyboard glass.
5) Remove the copyboard glass retainer (left); two screws.
6) Remove the control panel; see Figure 4-103.
7) Remove the three screws from the rear cover, two screws from the upper right cover, and the screws from the left cover.
8) Remove the three flat-headed screws and three screws.



① Flat-headed screws
② Screws
③ Upper cover

Figure 4-106

9) Detach the two face plates for the projector using a flat blade screwdriver.



① Face plates

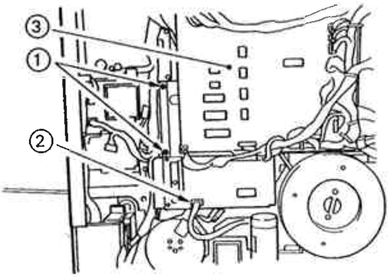
Figure 4-107

10) Remove the two screws from the rear (left, right), and remove the upper cover.

Note:
The front of the upper cover serves to accommodate harnesses.

5. Opening the DC Controller PCB

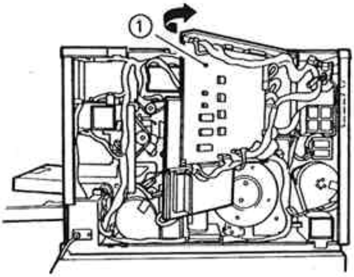
1) **Disconnect the power plug.**
2) Remove the rear cover.
3) Remove the two screws from the DC controller PCB support, and disconnect connector J656 (5P).



① Screws ③ DC controller PCB
② Connector (J656)

Figure 4-108 (rear)

4) Open the DC controller PCB.



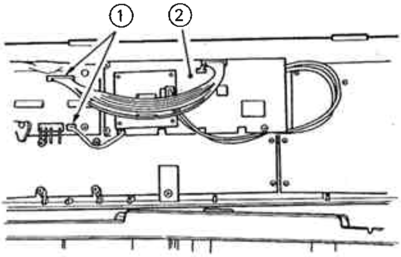
① DC controller PCB

Figure 4-109

Note:
Take care not to trap the harnesses when opening the DC controller PCB.

6. Removing the LCD Unit

1) Remove the control panel; see Figure 4-103.
2) Remove the four screws (M3X6), and disconnect the two connectors (10P, 2P).



① Connectors ② LCD unit

Figure 4-110

3) Remove the LCD unit.

B. Fans and Blowers

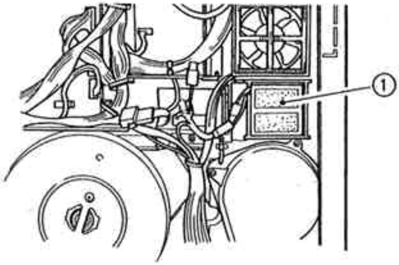
1. Outline

- The machine is equipped with nine fans which serve to prevent the machine from over-heating by circulating the air inside it; each fan is assigned the following function:
- Primary corona unit fan (FM1). Used to remove the ozone from around the primary corona unit.
- Ozone exhaust fan (FM2). Used to take in the ozone from around the drum.
- Toner suction fan (FM3). Used to take in the toner from around the transfer drum and photosensitive drum.
- Cooling fan 1 (FM4). Used to prevent the CCD and copyboard glass from over-heating by heat from the scanning lamp.
- Cooling fan 2 (FM5). Used to prevent the CCD and copyboard glass from over-heating by heat from the scanning lamp.
- Laser/power supply cooling fan (FM6). Used to prevent the laser and DC power supply from over-heating.
- Fixing assembly fan (FM7). Used to take in oil vapor.
- Feeder fan (FM8). Used to keep copy paper in place while it is being fed.
- Developing assembly fan (FM9). Used to take in the toner from around the developing assembly.

2. Primary Corona Unit Fan (FM1)

a. Removing the Air Filter

1) Remove the rear cover.
2) Remove the filter.

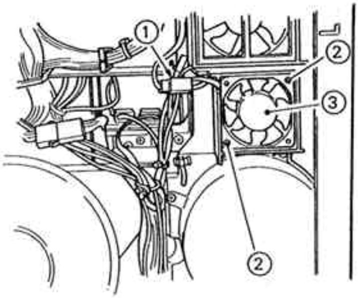


① Air filter

Figure 4-111

b. Removing the Primary Corona Unit Fan

1) Remove the air filter.
2) Remove the two screws, disconnect the connector, and remove the primary corona unit fan.



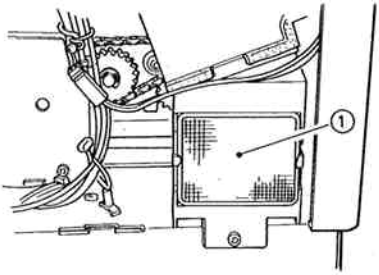
① Connector
② Screw
③ Primary corona unit fan

Figure 4-112

3. Ozone Exhaust Fan (FM2)

a. Removing the Ozone Filter

1) Remove the rear cover.
2) Remove the ozone filter.

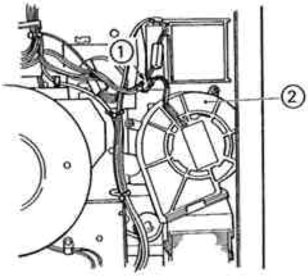


① Ozone filter

Figure 4-113

b. Removing the Ozone Exhaust Fan

1) Remove the three screws, and disconnect the connector.



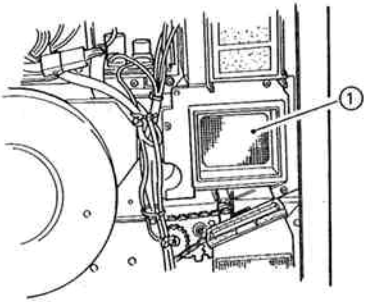
① Connector ② Ozone exhaust fan

Figure 4-114

2) Remove the ozone exhaust fan.

c. Removing the Air Filter

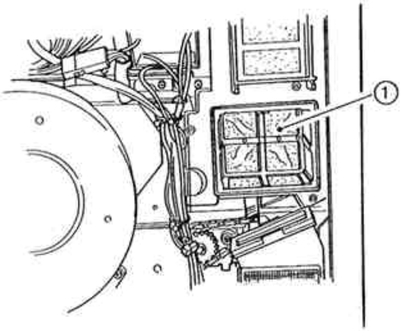
1) Remove the ozone filter.



① Ozone filter

Figure 4-115

2) Remove the air filter.



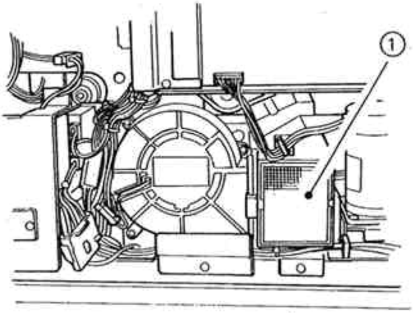
① Air filter

Figure 4-116

4. Toner Suction Fan (FM3)

a. Removing the Ozone Filter

1) Remove the rear cover.
2) Remove the ozone filter.

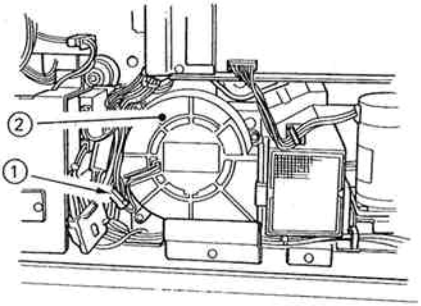


① Ozone filter

Figure 4-117

b. Removing the Toner Suction Fan

1) Remove the three screws, and disconnect the connector.

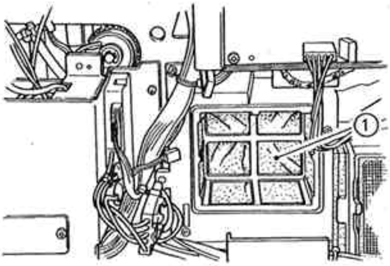


① Connector ② Toner suction fan

Figure 4-118

c. Removing the Air Filter

1) Remove the toner suction fan.
2) Remove the air filter.



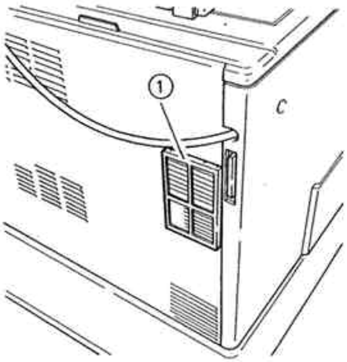
① Air filter

Figure 4-119

5. Laser/Power Supply Cooling Fan (FM6)

a. Removing the Air Filter

1) Remove the air filter from the rear of the copier.

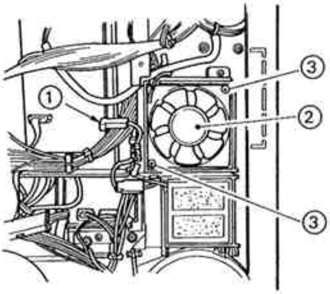


① Air filter

Figure 4-120

b. Removing the Laser/Power Supply Cooling Fan

1) Remove the rear cover.
2) Remove the two screws, and disconnect the connector.



① Connector
② Laser/power supply cooling fan
③ Screw

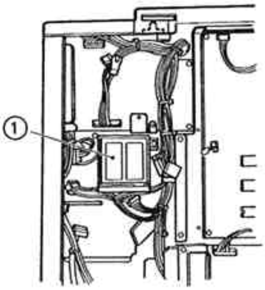
Figure 4-121

3) Remove the laser/power supply cooling fan.

6. Fixing Assembly Fan (FM7)

a. Removing the Air Filter

1) Remove the rear cover.
2) Remove the air filter.

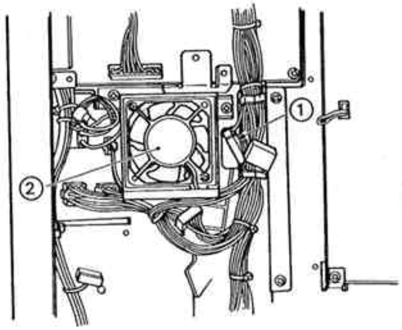


① Air filter

Figure 4-122

b. Removing the Fixing Assembly Fan

1) Remove the air filter.
2) Remove the two screws, and disconnect the connector.



① Connector
② Fixing assembly fan

Figure 4-123

3) Remove the fixing assembly fan.

Note:
Take note of the orientation of the filter and the direction of the air current when mounting the air filter and fan.

II. DRIVE SYSTEM

A. Drive Chain Layout

- The drive chain used in the drive system of the machine is laid out as shown in Figure 4-200.

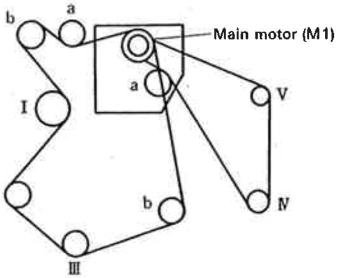


Figure 4-200

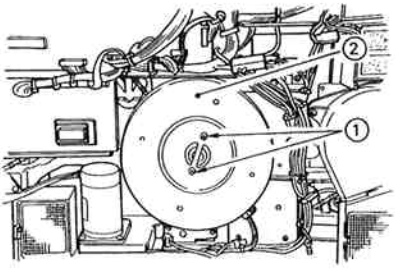
I Drive for fixing assembly/feeder unit (21T gear)
II Drive for pick-up unit (20T gear)
III Drive for registration roller (16T gear)
IV Drive for photosensitive drum cleaner (20T gear)
V Drive for hopper (16T gear)
a Tension gear (16T)
b Fixing gear (16T)

B. Drum Motor

1. Removing the Drum Motor (M2)

1) Remove the two screws with a spring washer, and remove the fly wheel.

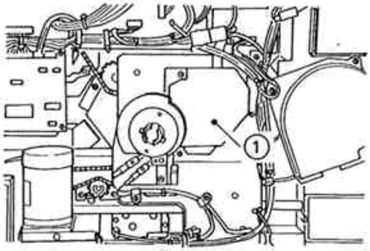
Note:
Check that the power plug is disconnected. Do not drop the fly wheel; it weighs about 5 kg.



① Screws (with spring washer, M5×8)
② Fly wheel

Figure 4-201

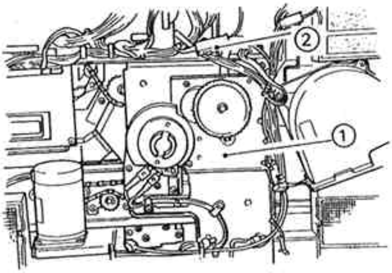
2) Remove the two screws, and remove the gear cover.



① Gear cover

Figure 4-202

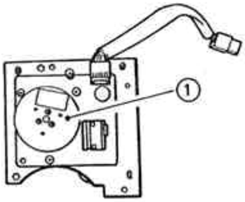
3) Remove the three screws from the drum motor unit, and disconnect the connector (6P).



① Drum motor unit ② Connector

Figure 4-203

4) Detach the harness from the harness mount.
5) Remove the three screws and harness, and remove the drum motor (M2).

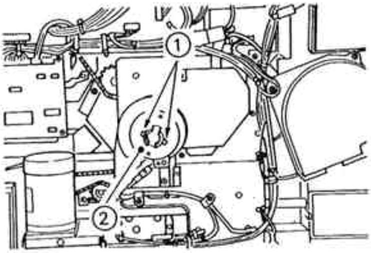


① Drum motor

Figure 4-204

2. Removing the Drum Heater

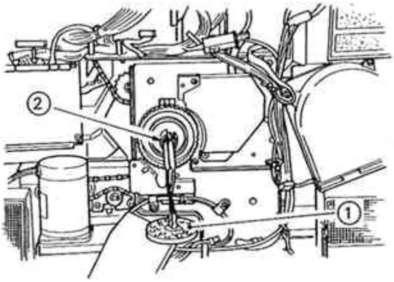
1) Remove the two screws with a spring washer, and remove the fly wheel; see Figure 4-201.
2) Remove the two hex screws, and remove the fly wheel support plate.



① Hex screws ② Fly wheel support plate

Figure 4-205

3) Remove the two screws, and remove the cover unit.
4) Remove the power supply coupling, and remove the drum heater.



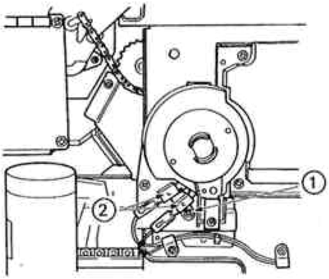
① Power supply coupling ② Drum heater

Figure 4-206

> **Note:**
> Take care not to damage the drum heater.

3. Removing the Drum Heater Brush

1) Open the DC controller PCB.
2) Remove the fly wheel; see Figure 4-201.
3) Remove the screw, and remove the drum heater brush.



① Screw ② Drum heater brush

Figure 4-207

4) Remove the two faston terminals, and remove the drum heater brush.

Note:
Check that the power plug is disconnected before removal; further, check that the drum heater brush is in contact with the groove of the power supply coupling after mounting it.

4. Points to Note When Mounting the Flywheel

a. To fix the flywheel support plate in place using a hex bolt, put a finger into the drum shaft, and push the flywheel support plate into the direction of B while pulling the shaft into the direction of A. If the drum shaft is displaced in the direction of B, the gear may override the photosensitive drum and the copies will have uneven images all over them at intervals of 3.14 mm.

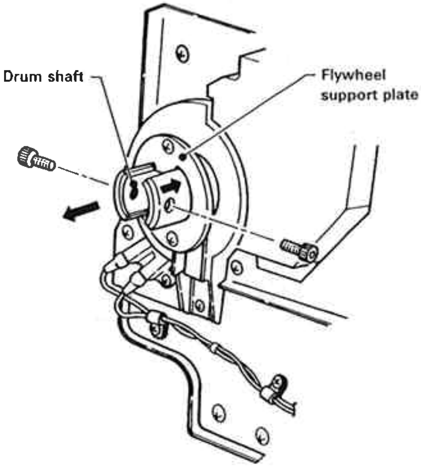


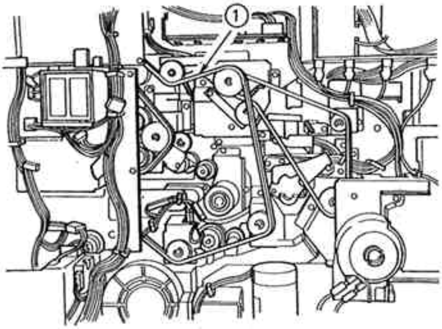
Figure 4-208

b. Use the screws shown to fix each of the following; a loose screw can cause uneven images at intervals of 3.14 mm (drum cycle).
- Flywheel Support Plate
  Hex bolt w/spring washer
- Flywheel
  Screw w/spring washer (M5 × 8)

C. Main Motor Drive Unit

1. Removing the Main Motor (M1)

1) Open the DC controller PCB.
2) Loosen the main motor drive chain, and detach it from the main motor gear; see Figure 4-200.

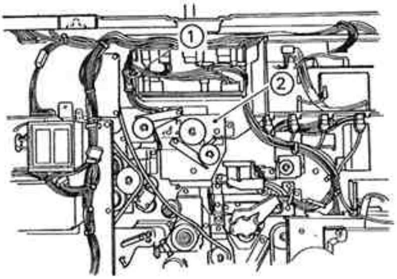


① Main motor drive chain

Figure 4-209

Note:
The main motor unit gear has a pin; do not drop it.

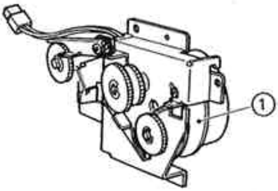
3) Remove the three screws, disconnect the connector, and remove the main motor box.



① Connector ② Main motor box

Figure 4-210

4) Remove the three screws (M3X6; w/ washer), and remove the main motor.



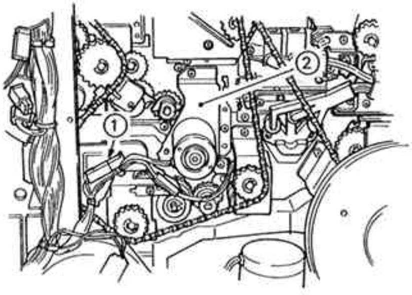
① Main motor

Figure 4-211

D. Transfer Drum Cleaner Unit

1. Removing the Transfer Cleaner Motor (M7)

1) Remove the rear cover.
2) Open the DC controller PCB; see Figure 4-108.
3) Remove the three screws, disconnect the connector (2P), and remove the transfer drum cleaner motor.



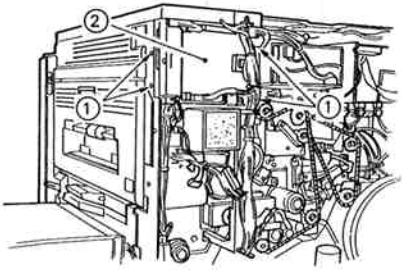
① Connector ② Transfer drum cleaner motor

Figure 4-212

E. Fixing Assembly/Feeder Unit Drive Unit

1. Removing the Fixing Assembly/Feeder Unit Drive Unit

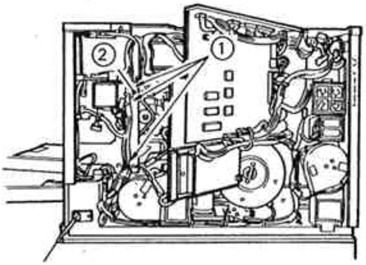
1) Remove the rear cover and rear right cover.
2) Remove the four screws, disconnect the four connectors (J601 through J604), and remove the scanner motor driver PCB.



① Screws ② Scanner motor driver PCB

Figure 4-213

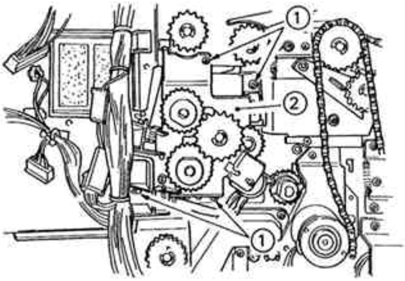
3) Open the DC controller PCB.
4) Remove the three screws, and remove the connector harness hinge.



① Screws ② Connector harness hinge

Figure 4-214

5) Remove the four screws, disconnect the connector, and remove the fixing assembly/feeder unit drive unit.



① Screws ② Fixing assembly/feeder unit drive unit

Figure 4-215

Note:
Check that the section circled (Figure 4-216) and bosses are properly engaged on the rear plate when mounting the fixing assembly/feeder unit drive unit.

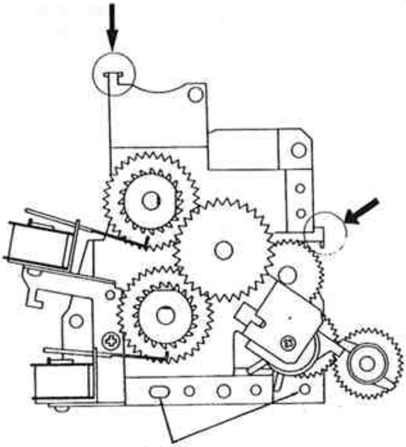


Figure 4-216

III. FEEDER SYSTEM

A. Pick-Up Unit

1. Construction

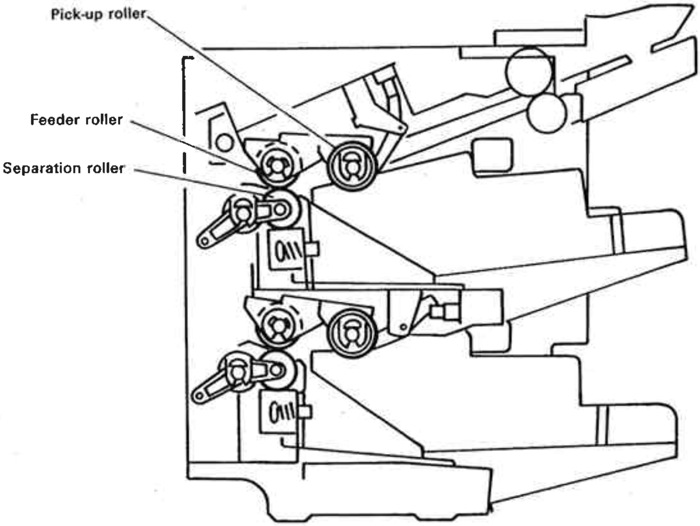

Pick-up roller
Feeder roller
Separation roller

Figure 4-300 (cross section)

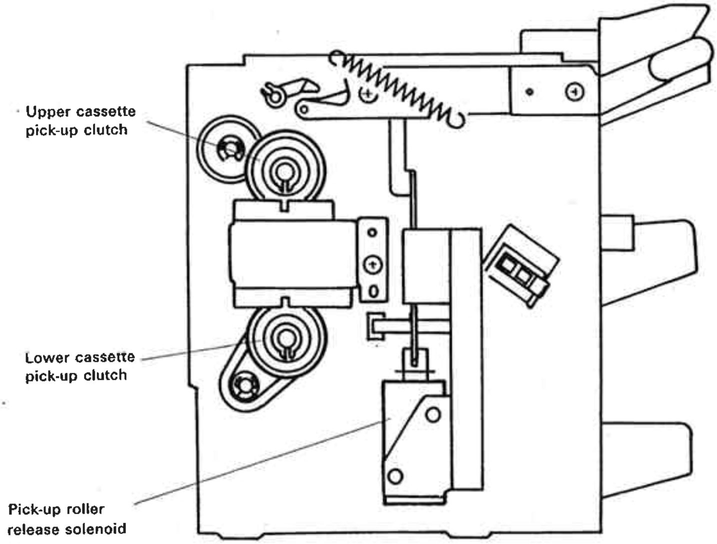
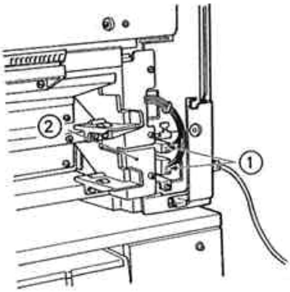

Upper cassette pick-up clutch
Lower cassette pick-up clutch
Pick-up roller release solenoid

Figure 4-301 (front view)

2. Removing the Pick-Up Unit

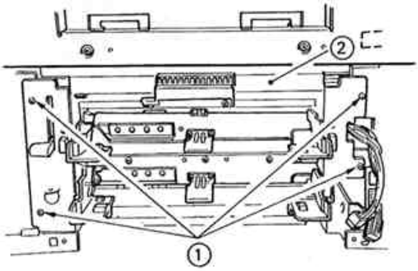
1) Release the lower feeder unit.
2) Remove the front right cover and rear right cover.
3) Disconnect the connectors (J87, 15P; J88, 9P).
4) Remove the screw, and remove the cover.



① Connectors ② Cover

Figure 4-302

5) Detach the harness from the harness retainer.
6) Remove the four screws, and remove the pick-up unit.

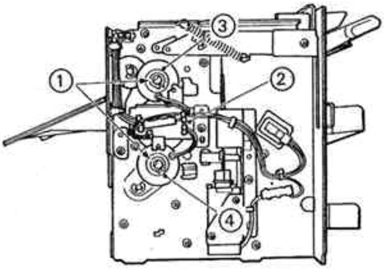


① Screws ② Pick-up unit

Figure 4-303

3. Removing the Upper Cassette Pick-Up Clutch (CL12) and Lower Cassette Pick-Up Clutch (CL13)

1) Remove the pick-up unit from the machine.
2) Disconnect the two connectors (2P) from the pick-up clutch.
3) Remove the screw, and remove the clutch slip stop plate.



① Grip ring	③ Upper cassette pick-up clutch
② Clutch slip stop plate	④ Lower cassette pick-up clutch

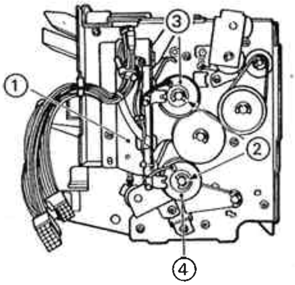
Figure 4-304

4) Remove the grip ring, and detach the clutch.

Note:
When attaching the pick-up clutch, make sure that the boss on the clutch is in the groove of the clutch slip stop plate.

4. Removing the Upper Cassette Lifter Clutch (CL10) and Lower Cassette Lifter Clutch (CL11)

1) Remove the pick-up unit from the machine.
2) Disconnect the two connectors (J89, 2P; J90, 2P).
3) Remove the screw, and remove the clutch slip stop plate.
4) Remove the E-ring, and remove the lifter clutch.

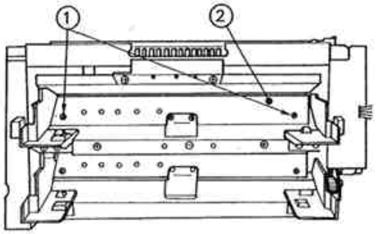


① Clutch slip stop plate
② E-ring
③ Upper cassette lifter clutch
④ Lower cassette lifter clutch

Figure 4-305 (rear view)

5. Removing the Upper Separation Roller (CLC200/300)

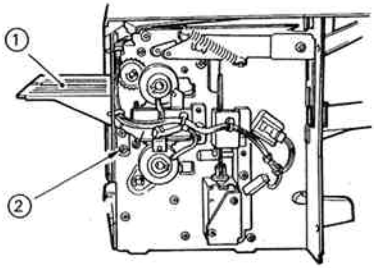
1) Remove the pick-up unit from the machine.
2) Remove the two screws, and remove the upper cassette pick-up guide plate.



① Screws
② Upper cassette pick-up guide plate

Figure 4-306

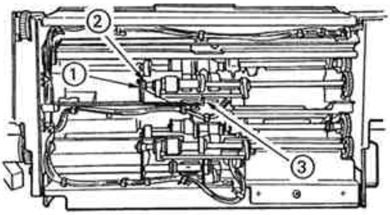
3) Remove the screw from the paper guide support shaft that holds the upper guide, and remove the upper guide.



① Upper guide
② Screw

Figure 4-307

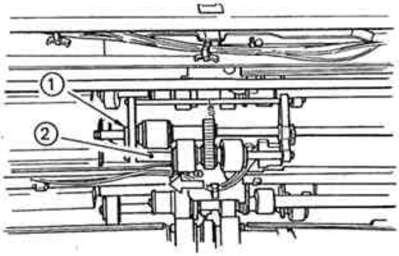
4) Remove the stop ring, bushing, and spring.



① Stop ring ③ Spring
② Bushing

Figure 4-308

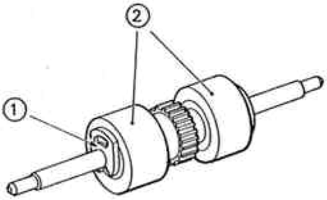
5) Pull out the separation roller shaft toward the front.
6) Remove the stop ring, and remove the separation roller unit.



① Stop ring ② Separation roller unit

Figure 4-309

7) Remove the stop ring, and remove the separation roller.



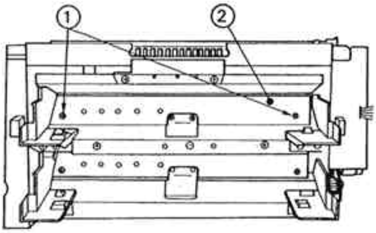
① Stop ring ② Separation roller

Figure 4-310

Note:
The CLC200/300 and the CLC350 use different types of rollers; keep the following in mind:
CLC200/300: FA4-8991
CLC350: FF5-1830

5a. Removing the Upper Separation Roller (CLC350)

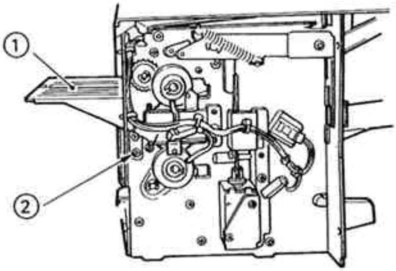
1) Remove the pick-up unit from the machine.
2) Remove the two screws, and remove the upper cassette pick-up guide plate.



① Screws
② Upper cassette pick-up guide plate

Figure 4-311

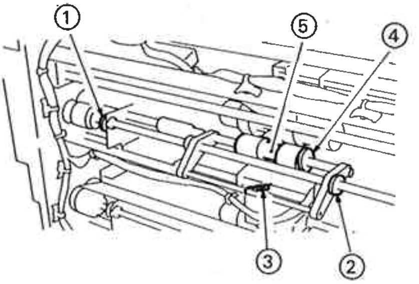
3) Remove the screw from the paper guide support shaft that holds the upper guide, and remove the upper guide.



① Upper guide
② Screw

Figure 4-312

4) Remove stop ring 1, stop ring 2, and spring; then, release the separation roller assembly.
5) Remove stop ring 3, and detach the separation roller.



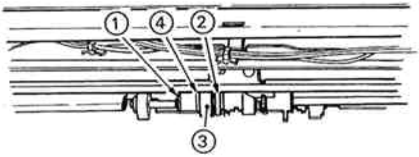
① Stop ring 1	④ Stop ring 3
② Stop ring 2	⑤ Separation roller
③ Spring	

Figure 4-313

Note:
The CLC200/300 and the CLC350 use different types of separation rollers; keep the following in mind:
CLC200/300: FA4-8991
CLC350: FF5-1830

6. Removing the Upper Cassette Feeder Roller

1) Remove the upper guide; see Figure 4-307.
2) Release the separation roller unit; see Figures 4-309 and 4-313.
3) Remove the stop ring, pull out the collar, and remove the feeder roller while moving it sideways together with the drive belt.



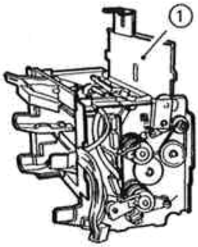
① Stop ring	③ Feeder roller
② Drive belt	④ Collar

Figure 4-314

Note:
The CLC200/300 and the CLC350 use different types of feeding rollers; keep the following in mind:
CLC200/300: FA5-9637
CLC350: FF5-1843

7. Removing the Upper Cassette Pick-Up Roller

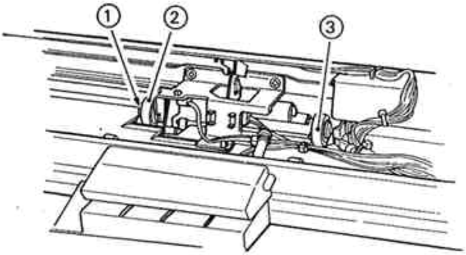
1) Remove the upper guide; see Figure 4-307.
2) Open the upper cover.



① Upper cover

Figure 4-315 (rear)

3) Set the manual feed lever to the manual feed position.
4) Remove the two stop rings, and remove the pick-up roller.



① Stop rings	③ Pick-up roller (rear)
② Pick-up roller (front)	

Figure 4-316

Note:

i. The pick-up roller unit has a pin; take care not to lose it.

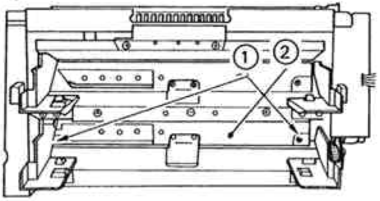
ii. Different pick-up rollers are used, front and rear; take note of the following when mounting them:
front: silver
rear: gold

iii. The CLC200/300 and the CLC350 use different types of pick-up rollers; keep the following in mind:

CLC200/300:	FF9-1314 (front)
	FF9-1315 (rear)
CLC350:	FF5-1838 (front)
	FF5-1839 (rear)

8. Removing the Lower Cassette Separation Roller (CLC200/300)

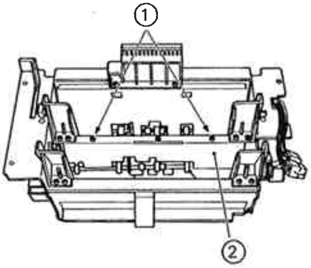
1) Remove the pick-up unit from the machine.
2) Remove the two screws, and remove lower pick-up guide plate I.



① Screws ② Lower pick-up guide plate I

Figfure 4-317

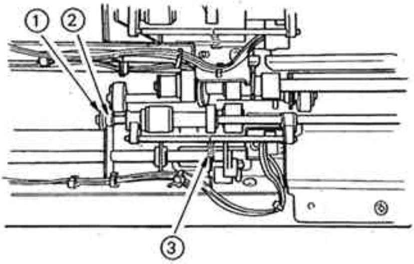
3) Remove the two screws, and remove lower pick-up guide plate II.



① Screws ② Lower pick-up guide plate II

Figure 4-318 (cassette side)

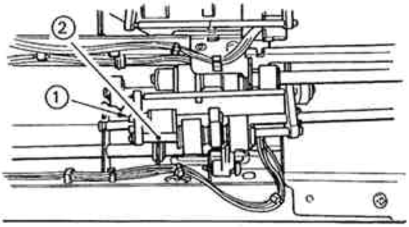
4) Remove the stop ring and spring, and remove the bushing.



① Stop ring ③ Spring
② Bushing

Figure 4-319

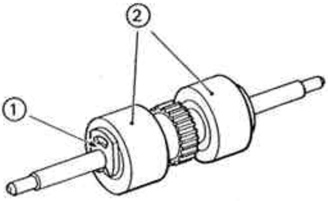
5) Push the separation roller shaft against the front side plate, and pull it out toward the front.
6) Remove the stop ring, and remove the separation roller unit.



① Stop ring ② Separation roller unit

Figure 4-320

7) Remove the stop ring, and remove the separation roller.



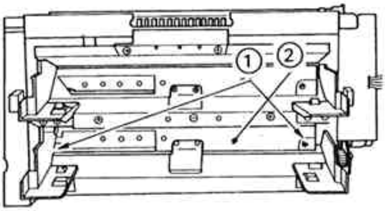
① Stop ring ② Separation roller

Figure 4-321

Note:
The CLC200/300 and the CLC350 use different types of separation rollers; keep the following in mind:
CLC200/300: FA4-8991
CLC350: FF5-1830

8a. Removing the Lower Cassette Separation Roller (CLC350)

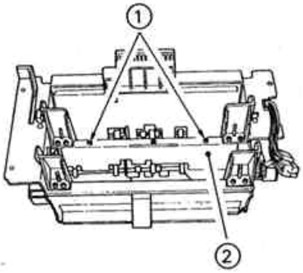
1) Remove the pick-up unit from the machine.
2) Remove the two screws, and remove the lower pick-up guide plate I.



① Screws
② Lower pick-up guide plate I

Figure 4-322

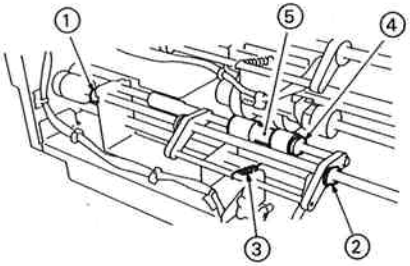
3) Remove the two screws, and remove lower pick-up guide plate II.



① Screws
② Lower pick-up guide plate II

Figure 4-323 (cassette side)

4) Remove stop ring 1, stop ring 2, and spring; then, release the separation roller assembly.
5) Remove stop ring 3, and detach the separation roller



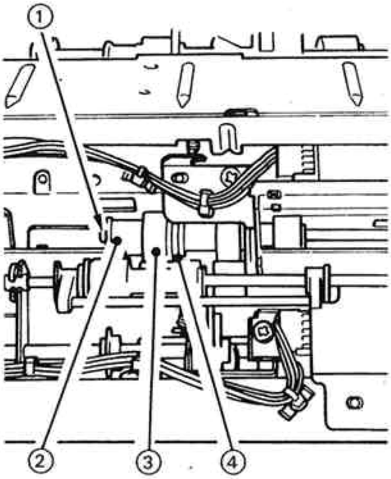
① Stop ring 1
② Stop ring 2
③ Spring
④ Stop ring 3
⑤ Separation roller

Figure 4-324

Note:
The CLC200/300 and the CLC350 use different types of separation rollers; keep the following in mind:
CLC200/300: FA4-8991
CLC350: FF5-1830

9. Removing the Lower Cassette Feeder Roller

1) Remove the stop ring and collar.
2) Remove the feeder roller while moving the drive belt sideways.



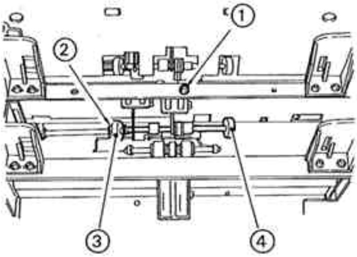
① Stop ring
② Collar
③ Drive belt
④ Feeder roller

Figure 4-325

> **Note:**
> The CLC200/300 and the CLC350 use different types of feeding rollers; keep the following in mind:
> CLC200/300: FA5-9637
> CLC350: FF5-1843

10. Removing the Lower Cassette Pick-Up Roller

1) Remove the pick-up unit from the machine.
2) Remove lower pick-up guide plate I; see Figure 4-317.
3) Remove lower pick-up guide plate II; see Figure 4-318.
4) Remove the lower cassette paper sensor (1 screw).
5) Remove the stop ring, and remove the pick-up roller.



① Screw
② Stop ring
③ Pick-up roller (front)
④ Pick-up roller (rear)

Figure 4-326 (cassette side)

> **Note:**
> i. The pick-up roller has a pin; take care not to drop it.
> ii. Different pick-up rollers are used for the front and rear; take note of the following when mounting them:
> front: silver
> rear: gold
> iii. The CLC200/300 and the CLC350 use different types of pick-up rollers; keep the following in mind:
> CLC200/300: FF9-1314 (front)
> FF9-1315 (rear)
> CLC350: FF5-1838 (front)
> FF5-1839 (rear)

11. Positioning the Pick-Up Roller Release Solenoid (SL14)

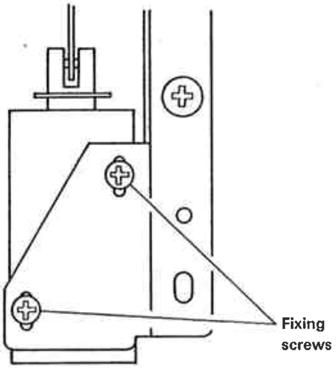


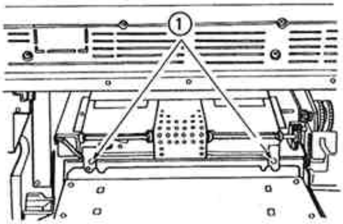
Figure 4-327

1) Loosen the fixing screws on the solenoid.
2) Push the solenoid down with the mobile core pulled fully; tighten the screw where the solenoid stops.

B. Feeder Unit

1. Removing the Feeder Unit

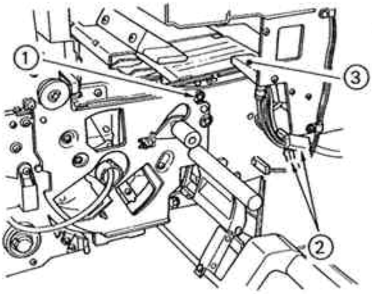
1) Remove the fixing assembly; see page 4-87.
2) Insert a screwdriver from the fixing assembly side, and remove the two screws.



① Screws

Figure 4-328

3) Remove the inside right cover and transfer drum cover.
4) Disconnect the two feeder unit connectors (2P, 9P), and remove the E-ring and bracket (1 screw).



① E-ring

② Connectors (2P, 9P)

③ Bracket

Figure 4-329

5) Put a hand from the fixing assembly side, and remove the feeder unit.

Note:
Keep the connector harness of the feeder unit inside the machine so as to avoid damage to the harness or the inside of the machine when removing or mounting the feeder unit.

2. Positioning the Separation Solenoid (SL13)

1) Remove the transfer drum; see p. 4-26 and 27.
2) Push the metal core of the solenoid inside, and fix it in place when the arm comes into contact with the metal plate using the adjusting screw so that the value is as shown in Figure 4-330.

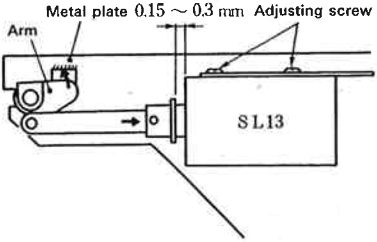


Figure 4-330

C. Transfer Drum Unit

1. Construction

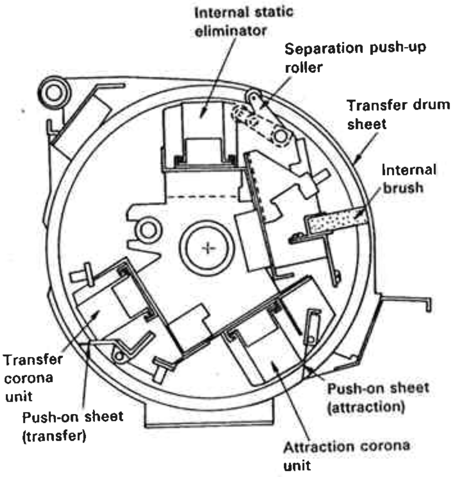

Internal static eliminator
Separation push-up roller
Transfer drum sheet
Internal brush
Transfer corona unit
Push-on sheet (transfer)
Push-on sheet (attraction)
Attraction corona unit

Figure 4-331 CLC200

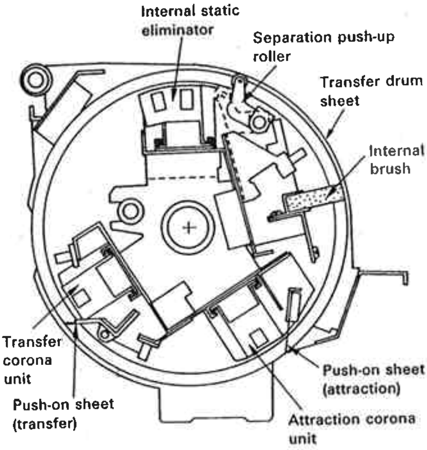
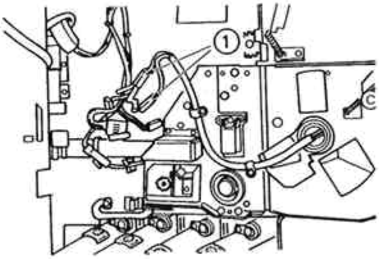

Internal static eliminator
Separation push-up roller
Transfer drum sheet
Internal brush
Transfer corona unit
Push-on sheet (transfer)
Push-on sheet (attraction)
Attraction corona unit

Figure 4-331a CLC300/350

2. Removal from the Machine (CLC200)

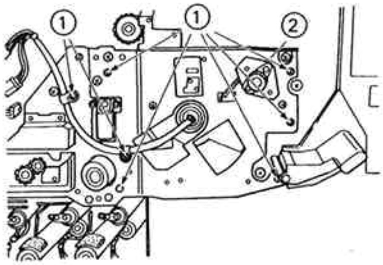
1) Open the hopper unit; see page 4-84.
2) Remove the two connectors (5P, 6P) of the transfer drum unit harness.



① Connectors

Figure 4-332

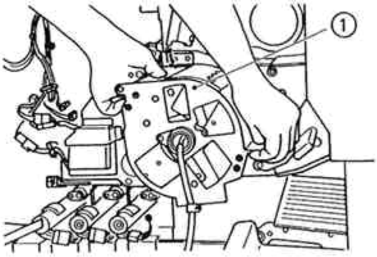
3) Remove the two mounting screws for the harness and five mounting screws for the transfer drum positioning plate.



① Screws ② Transfer drum positioning plate

Figure 4-333

4) Remove the transfer drum positioning plate.
5) Remove the transfer drum; take extra care not to damage it.



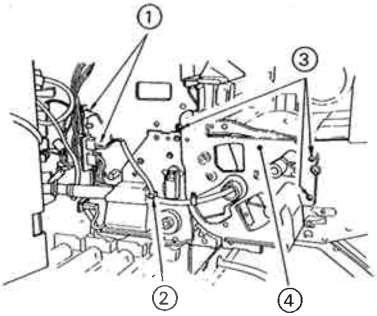
① Transfer drum

Figure 4-334

Note:
- i. Do not touch the transfer drum sheet.
- ii. Avoid contact with the separation roller when pulling out the transfer drum.
- iii. Lift the transfer drum slightly if its stay comes into contact with the front side plate of the machine.
- iv. Place the transfer drum on copy paper.

2a. Removal from the Machine (CLC300/350)

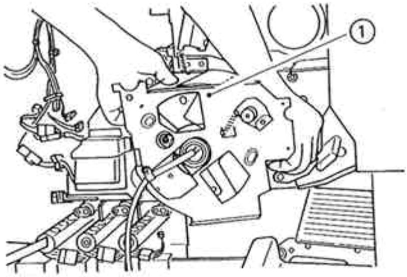
1) Open the hopper unit; see page 4-86.
2) Detach the transfer drum cover.
3) Remove the three connectors (2P, 5P, 6P) of the transfer drum unit harness.
4) Detach the harness from the harness retainer.



① Connectors	④ Transfer drum positioning plate
② Harness retainer	
③ Screw	

Figure 4-335

5) Remove the three screws, and detach the transfer drum together with its positioning plate.



① Transfer drum

Figure 4-336

Note:

i. Do not touch the transfer drum sheet.

ii. Avoid contact with the separation roller when pulling out the transfer drum.

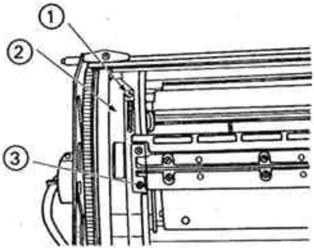
iii. Lift the transfer drum slightly if its stay comes into contact with the front side plate of the machine.

iv. Place the transfer drum on copy paper.

3. Replacing the Transfer Drum Sheet (CLC200)

a. Removing the Transfer Drum Sheet

1) Remove the transfer drum.
2) Place the transfer drum on a desk as shown in Figure 4-338.
3) Remove the screws, and remove the transfer drum end scrapers (front, rear).
4) Unhook the sheet tension springs (front, rear) from the sheet end using tweezers.
5) Remove each of the screws, and detach the sheet tension spring and retainer spring (front; rear).



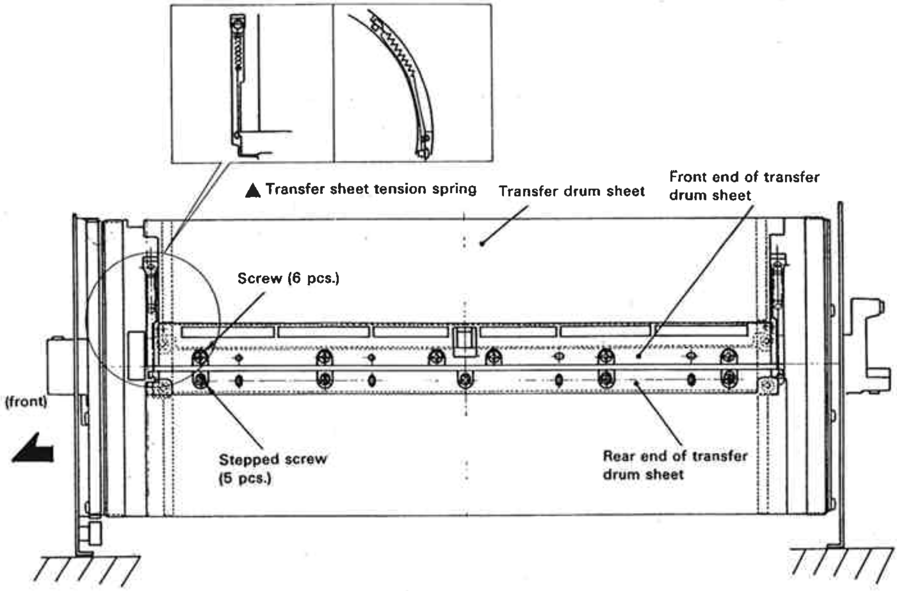
① Screw

② Sheet tension screw and retainer spring

③ Rear end of sheet

Figure 4-337

6) Remove the six screws (M3X3) from the front end of the transfer drum sheet; see Figure 4-338.
7) Remove the five screws (M2.6; stepped) from the rear end of the transfer drum sheet; see Figure 4-338.
8) Hold the front end of the transfer drum sheet, and remove the transfer drum sheet while turning the transfer drum clockwise.

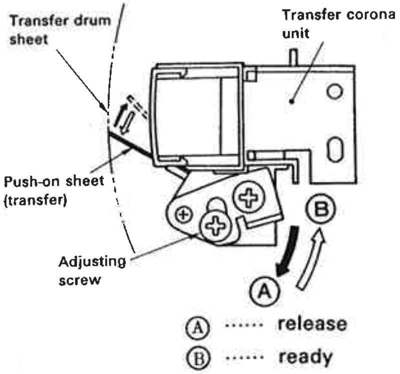


▲ Transfer sheet tension spring
Transfer drum sheet
Front end of transfer drum sheet
Screw (6 pcs.)
(front)
Stepped screw (5 pcs.)
Rear end of transfer drum sheet

Figure 3-338

b. Attaching the Transfer Drum Sheet

1) Move the push-on sheet (transfer) to the release position, and fix it in place (A).

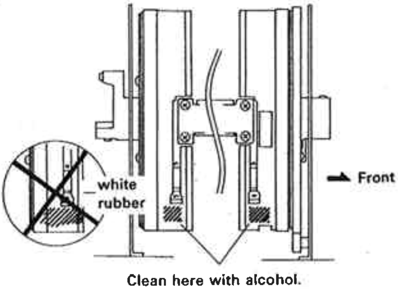


Transfer drum sheet
Transfer corona unit
Push-on sheet (transfer)
Adjusting screw
B
A
Ⓐ …… release
Ⓑ …… ready

Figure 4-339

2) Clean the part of the ring to which the double-sided adhesive tape is to be attached at the leading edge of the transfer drum sheet with alcohol.

Note:
The white rubber of the ring is coated with a lubricant; do not clean that part.



white rubber
Front
Clean here with alcohol.

Figure 4-340

3) Place the transfer drum at the edge of the desktop as shown in Figure 4-341, and attach the transfer drum sheet with six screws (M3×3 screws; remove the back sheet of the double-sided adhesive tape in advance).

Note:
1. The transfer drum sheet fixed with six screws must hang from the desk by its own height.
2. Tighten the screws well; otherwise, they can damage the photosensitive drum. Further, pay attention to the plastic foam when tightening the screws.

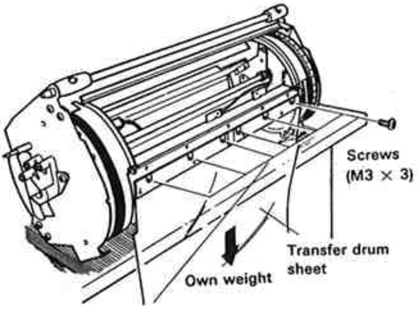


Figure 4-341

4) Keep two mylar spacers between the leading edge of the transfer drum sheet and two-sided adhesive tape, and turn the transfer drum so that the sheet wraps around the drum by its own weight; see Figure 4-342,

Note:
Attachment of plastic spacers creates a margin along the leading edge of the sheet, thereby helping to prevent transfer faults along the leading edge.

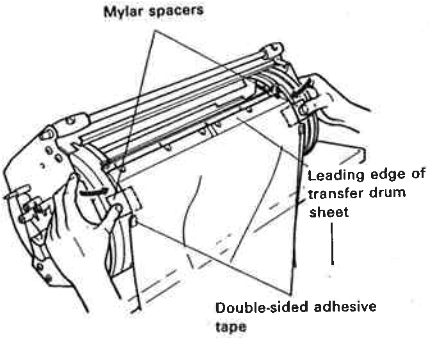

Mylar spacers
Leading edge of transfer drum sheet
Double-sided adhesive tape

Figure 4-342

5) Press on the transfer drum sheet to make sure that the two-sided adhesive tape under it is firmly glued.

Note:
Do not pull on the transfer drum sheet when attaching the tape; doing so could deform the transfer drum sheet, resulting in transfer faults along the leading edge.

6) Turn the transfer drum further, and fix the end of the transfer drum sheet using five stepped screws.

Note:
1. When attaching the transfer drum sheet, wrap it evenly while keeping its front and rear in place with fingers. Do not pull the sheet excessively when fixing its trailing edge in place; doing so could deform the transfer drum sheet, resulting in transfer faults along the leading edge.
2. Be sure to tighten the screw fully to avoid damage to the photosensitive drum.
3. Make sure the movement is smooth with the trailing edge of the sheet not coming into contact with the stepped screw.
4. Rotate the transfer drum, and check that the sheet is free of scratches or dents.
5. If the original screw had a washer, replace it with a stepped screw without a washer (FY1-0711-000 or FS2-9142-020).

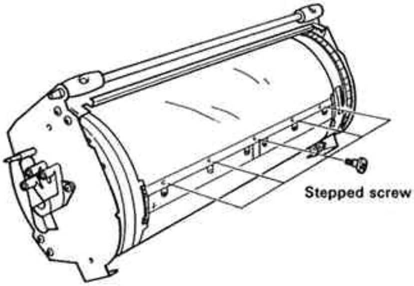


Figure 4-343

7) Pull out the two spacers attached in step 4).
8) Clean the section shown in Figure 4-344 (front, rear) using alcohol.

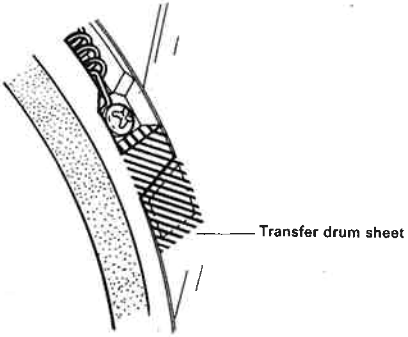


Figure 4-344

9) Remove the back-up sheet from the transfer drum sheet push-on sheet.

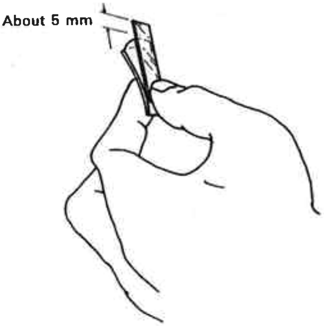


Figure 4-345

10) Attach the transfer drum sheet push-on seal.

Standards

- End of transfer drum sheet two-sided tape; see Figure 4-346.
- 1±0.5 mm from transfer drum sheet end; see Figure 4-347.

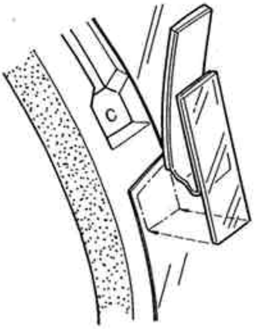


Figure 4-346

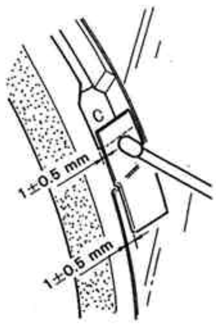


Figure 4-347

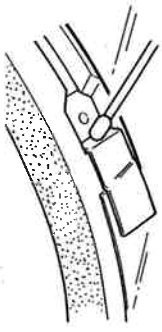


Figure 4-347a

11) Press on the crease of the seal firmly using a cotton swab so that the transfer drum push-on seal will not peel because of interference against the transfer drum end scraper; see Figure 4-347. Further, bend over the end of the seal, and press it down; see Figure 4-347a. Check that the other end of the seal will not come up; otherwise, its contact with the end scraper would hinder rotation.
12) Attach another transfer drum sheet push-on seal on the front side of the transfer drum sheet also.
13) Fix the tension spring for the transfer drum sheet together with the retaining leaf spring to the transfer drum ring (front, rear); then, attach the hook to the trailing edge of the sheet.

Note:
Take care so that the bend of the retaining leaf spring will not protrude over the transfer drum sheet.

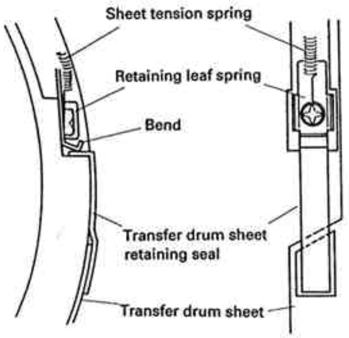


Figure 4-348

14) Return the transfer push-on sheet to its ready position, and fix it in place.
15) Mount the transfer drum end scraper (front, rear).
16) Mount the transfer drum on the copying machine.

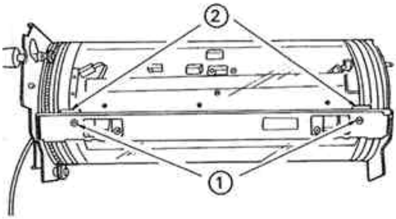
Note:
i. Do not touch the section of the transfer drum sheet over which copy paper will be retained.
ii. Study the transfer drum sheet after attachment, and check for dents, slack, and scratches.
iii. Check that the tension springs of the transfer drum sheet are properly oriented.

3a. Replacing the Transfer Drum Sheet (CLC300/350)

a. Detaching the Transfer Drum Sheet

When the transfer drum positioning sheet is detached, the ring connecting plate causes the transfer drum to rotate; work without detaching the positioning plate.

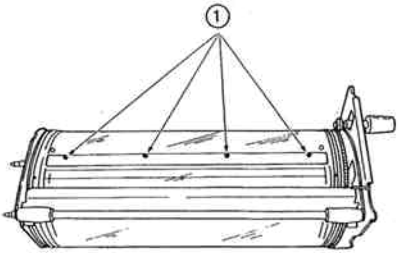
1) Detach the transfer drum.
2) Place the transfer drum on a desk as shown in Figure 4-349.
3) **Remove the screw from the transfer drum scraper (front, rear).**



① Screw ② Transfer drum scraper

Figure 4-349

4) Detach the trailing edge of the transfer drum sheet.
5) Remove the four stepped screws from the transfer drum sheet support plate (leading edge).



① Screws

Figure 4-350

6) Hold the transfer drum sheet support plate (leading edge), and detach the transfer sheet starting with its leading edge.

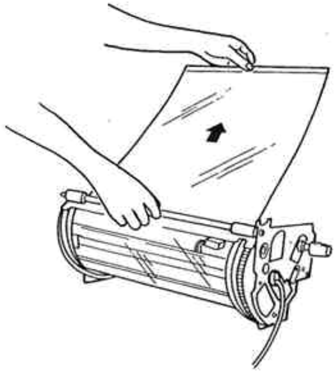


Figure 4-351

Note:
Do not hold the transfer drum ring connecting plate. Further, remove all tape from the ring.

b. Attaching the Transfer Drum Sheet

Note:
Do not touch the area of the transfer drum sheet to which copy paper will be attracted.

1) Place the transfer drum on the edge of a desk as shown in figure 4-352.

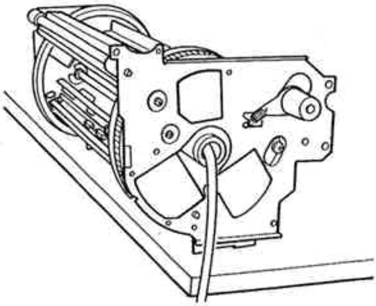
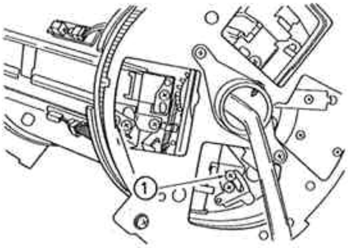


Figure 4-352

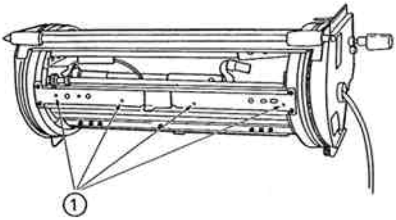
2) Loosen the screws on the transfer push-on sheet and the attraction push-on sheet shown in Figure 4-353, and rotate the drum in the direction of disengagement; then, tighten the screws.



① Screws

Figure 4-353

3) Clean the section over which adhesive tape will be attached on the transfer drum using alcohol solution.
4) Tighten the four stepped screws (M2×6), which held the transfer drum sheet to the ring connecting plate.

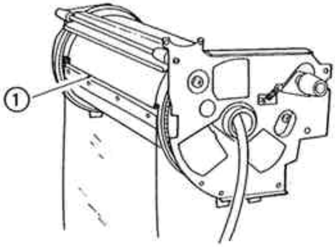


① Screw

Figure 4-354

Note:
If loose, these screws can damage the photosensitive drum; be sure to tighten them.

5) Rotate the ring so that the ring connecting plate is positioned as shown in Figure 4-355.
6) Hook the transfer drum sheet support (leading edge) on the stepped screw on the ring connecting plate, and let the transfer sheet hang on its own weight.



① Ring connecting plate

Figure 4-355

Note:
Make sure there is no gap between the U groove of the transfer sheet support plate (leading edge) and the stepped screws.

7) Detach the adhesive tape
8) While keeping the index fingers on both ends of the transfer sheet, rotate the transfer drum by the thumbs.

Note:
1. Do not force the fingers against the sheet; the sheet is properly attached if it is free of slack.
2. Take care so that the sheet will not ride over the white rubber inside the ring.

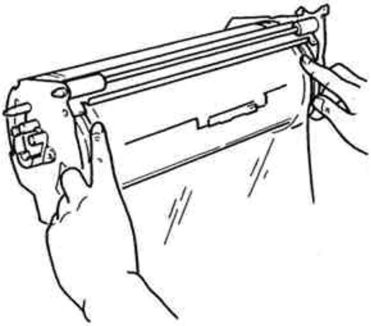


Figure 4-356

Note:
The gap between the leading and trailing edges of the transfer drum sheet should be ±2 mm or less.

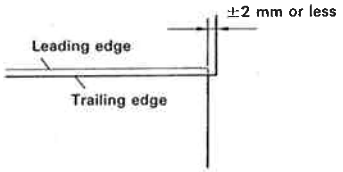


Figure 4-357

9) Attach the trailing edge of the transfer drum sheet over its leading edge while keeping it in contact with the drum and tapping it lightly.

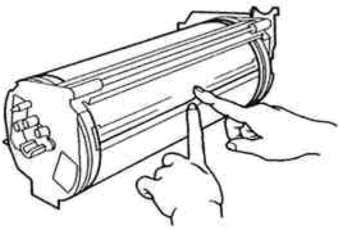


Figure 4-358

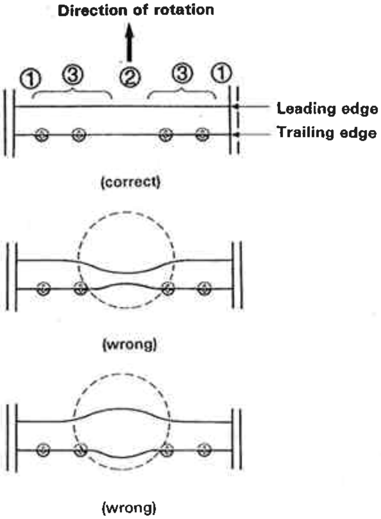


Figure 4-359

Note:
Make sure that the sheet is even and free of slack, particularly at the center; otherwise, bumps, if any, can come into contact with the photosensitive drum, resulting in fused toner and cleaning failure. Slack, on the other hand, can cause faulty transfer, color displacement, or other image faults.

10) Smooth out the lengths of the transfer sheet under which adhesive tape has been attached with a finger to make sure that the sheet has been properly attached.
11) Check that the transfer sheet is free of scratches and dents.
12) Attach the end scraper (front, rear).
13) Engage the transfer push-on sheet and the attraction push-on sheet.
14) Set the transfer drum in the copying machine.

Note:
i. Do not touch the section of the transfer drum sheet over which copy paper will be retained.
ii. Study the transfer drum sheet after attachment, and check for dents, slack, and scratches.

4. Mounting the Transfer Drum (CLC200)

a. Inserting the Transfer Drum

1) Hold sections Ⓐ and Ⓑ of the transfer drum, and mount it on the rails of the machine so that sections Ⓑ and Ⓒ are engaged.

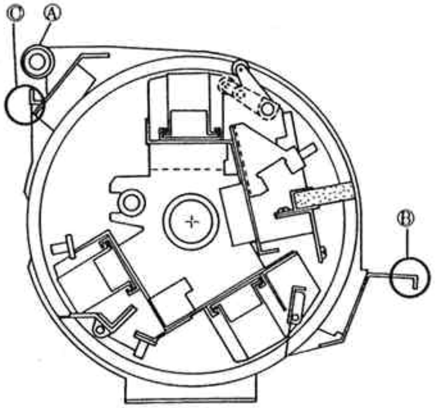


Figure 4-360

b. Mounting the Transfer Drum Positioning Plate

1) Set the transfer drum; thereafter, lead the transfer drum harness ① through the opening of the positioning plate ②.
2) Match the transfer drum positioning plate over the positioning boss ③ and transfer drum support shaft ④.
3) Hold the handle ⑤, and mount the transfer drum positioning plate ② while moving it away from the transfer drum link gear.

Note:
The end of the handle is equipped with a drive gear so that the transfer drum can be turned by hand.

4) Fix it using five mounting screws; ⑥ through ⑩.

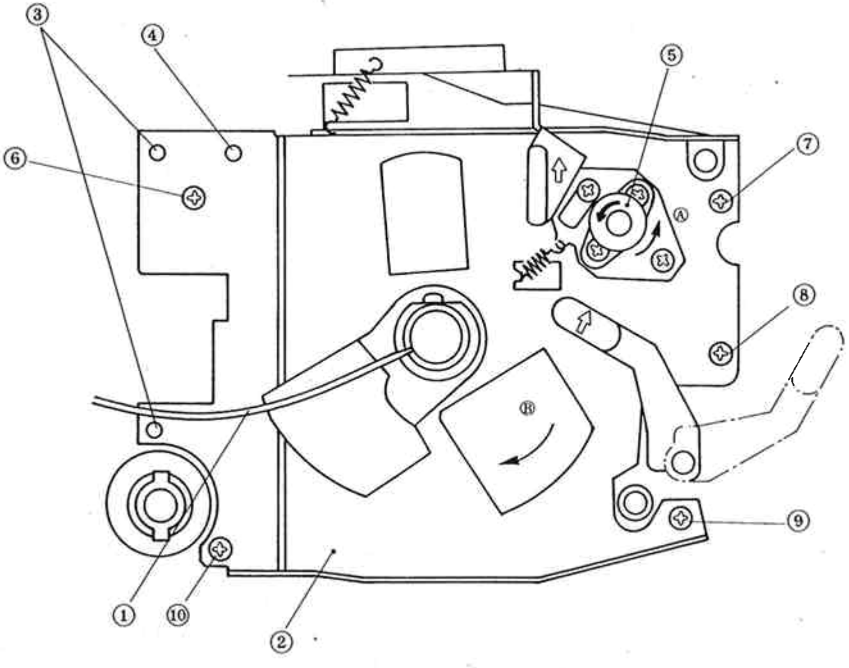


Figure 4-361

Note:

i. Check that the positioning plate is on the positioning boss and transfer drum support shaft.

ii. Check that the transfer drum rotates in the direction of arrow B when the handle is turned in the direction of arrow A and will not rotate in the opposite direction when the transfer drum is released.

iii. Shift the release lever back to its original position after mounting the transfer drum positioning plate.

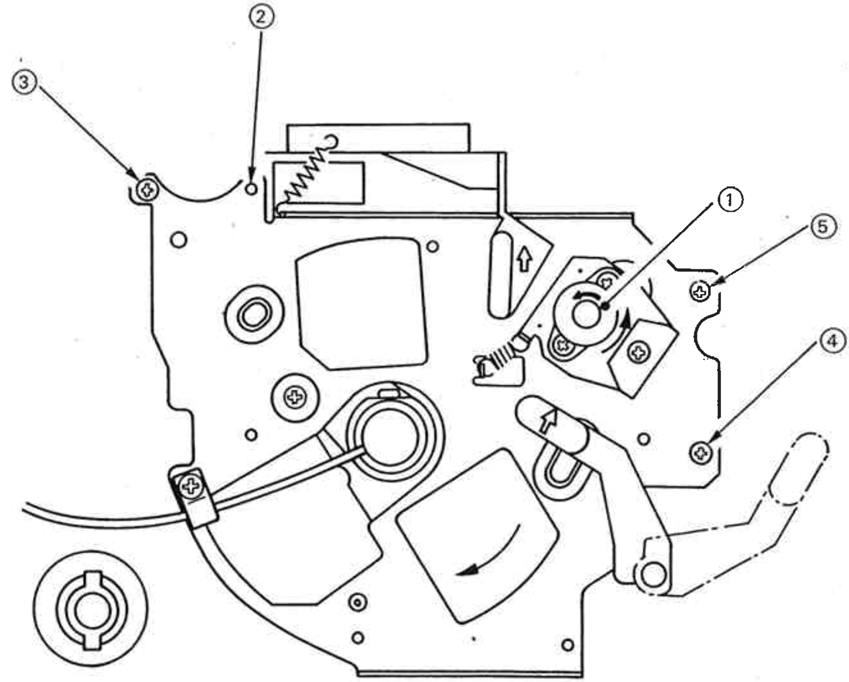


Figure 4-363

4a. Mounting the Transfer Drum (CLC300/350)

1) Hold sections Ⓐ and Ⓑ of the transfer drum, and mount it on the rails of the machine so that sections Ⓑ and Ⓒ are engaged.

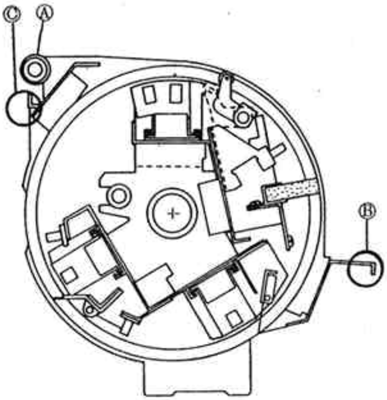


Figure 4-362

2) Match the positioning pin ② of the transfer drum positioning plate with the hole in the plate on the copier side.
3) Hold the handle ①, and mount the transfer drum unit while disengaging the transfer drum gear.

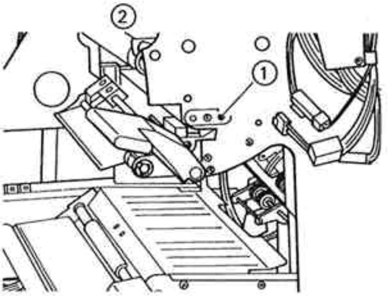
Note:
The end of the handle is equipped with a drive gear so that the transfer drum can be turned by hand.

4) Fix it using three mounting screws; ③ through ⑤.

Note:
- i. Check that the positioning pin on the transfer drum positioning plate is fully fitted.
- ii. Check that the transfer drum rotates in the direction of arrow B when the handle is turned in the direction of arrow A and will not rotate in the opposite direction when the transfer drum is released.
- iii. Shift the release lever back to its original position after mounting the transfer drum positioning plate.

5. Removing the Transfer Drum Cleaner Unit

1) Remove the inside right cover.
2) Remove the transfer drum.
3) Remove the screw, and remove the support unit of the transfer drum cleaner unit.



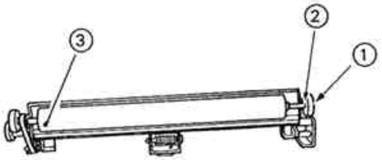
① Support unit
② Transfer drum cleaner unit

Figure 4-364

6) Remove the transfer drum cleaner unit.

6. Removing the External Brush of the Transfer Drum Cleaner

1) Remove the three E-rings, roller, and bearing.
2) Loosen the screw, and remove the cleaner external brush through the front.

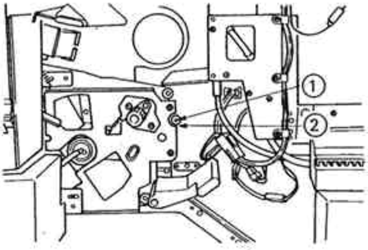


① Roller
② Bearing
③ Cleaner external brush

Figure 4-365

7. Removing the Pressure Unit of the Transfer Drum Cleaner

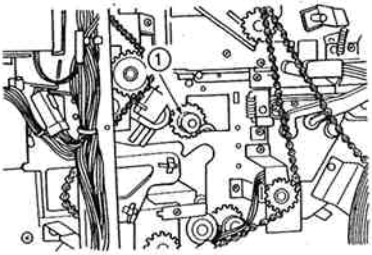
1) Remove the inside right cover.
2) In the case of the CLC300/350, detach the transfer drum cover.
3) Remove the E-ring and bushing.



① E-ring ② Bushing

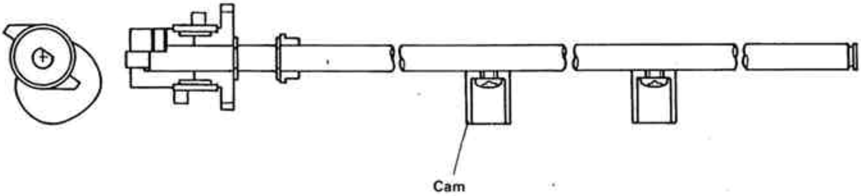
Figure 4-366 (front)

4) Remove the transfer drum cleaner unit; see Figure 4-367.
5) Remove the rear cover.
6) Open the DC controller PCB.
7) Remove the transfer drum cleaner motor.
8) Remove the pressure unit of the transfer drum cleaner.



① Pressure unit of transfer drum cleaner

Figure 4-367 (rear)

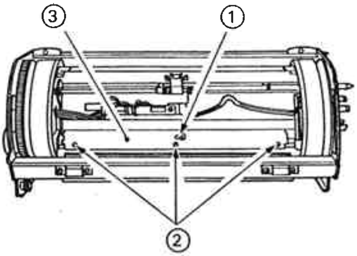


▲ Pressure unit of transfer drum cleaner (engaged)

Figure 4-368

8. Removing the Internal Brush

1) Remove the transfer drum sheet.
2) Remove the spring and three screws, and remove the internal brush.



① Spring
② Screws
③ Internal brush

Figure 4-369

Note:
Take care not to deform the spring.

9. Removing the Push-On Sheet

- Push-on sheet (transfer)

1) Disengage the push-on sheet.
2) Remove the two screws, and remove the transfer corona unit.
3) Remove the push-on sheet (transfer).

- Push-on sheet (attraction)

1) Remove the transfer drum sheet.
2) Remove the attraction corona unit; CLC300/350 only.
3) Remove the two screws, and remove the push-on sheet unit (attraction).

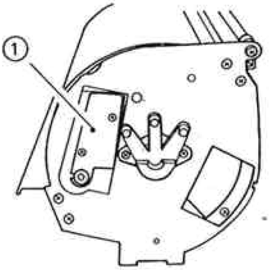
10. Points to Note When Replacing the Attraction Push-On Sheet

At times, attraction faults can cause air gaps between the transfer drum sheet and copy paper, causing coarse images or white spots along the trailing edge of the copies. A metal plate is added to the leading edge of the attraction push-on sheet to prevent the problem; adjust the height of the transfer corona wire depending on the presence/absence of the metal plate.

Attraction Push-On Sheet	Height of Transfer Corona Wire
w/o metal plate (FF2-2835)	10.5 ±0.2 mm
w/ metal plate (FF2-5746)	10.0 ±0.2 mm

11. Positioning the Inside Brush Solenoid (SL2)

1) Remove the transfer drum.
2) Remove the transfer drum sheet.
3) Turn the transfer drum clockwise until the adjusting screw of the inside brush comes into view.



① Internal brush solenoid

Figure 4-370

4) Push the metal core of the solenoid inside, and fix it in place when the inside brush comes into contact with the stopper at the front using the adjusting screw so that the value is as shown in Figure 4-348.

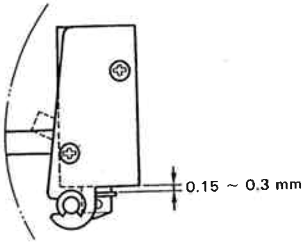
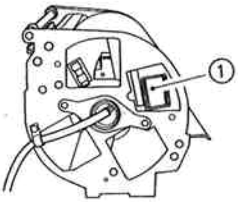


Figure 4-371

12. Adjusting the Separation Push-Up Solenoid (SL1)

1) Remove the transfer drum.
2) In the case of the CLC300/350, remove the two stepped screws, and detach the transfer drum positioning plate.
3) Remove the transfer drum sheet.
4) Turn the transfer drum clockwise until the adjusting screw for the separation push-up solenoid comes into view.



① Separation push-up solenoid

Figure 4-372

5) Push the metal core of the solenoid inside, and fix it when the stopper pin comes into contact with the top of the U-groove using the adjusting screw so that the value is as shown in Figure 4-350.

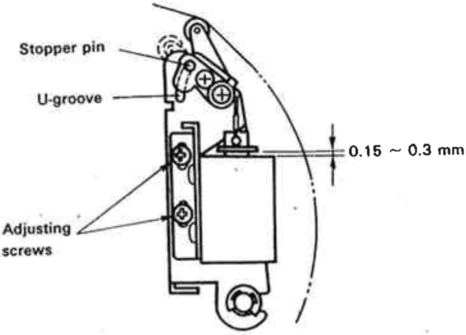


Figure 4-373

13. Adjusting the Transfer Push-On Sheet Release Solenoid (SL16;CLC350 only)

1) Detach the transfer drum.
2) Detach the transfer drum sheet.
3) Attach the solenoid so that the position A of the lever shown in Figure 4-374 is 20.2 ±0.5 mm when the metal core of the solenoid is pushed in by a finger.

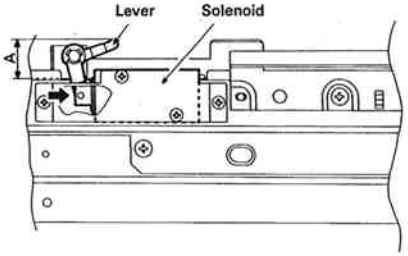


Figure 4-374

D. Lower Feeder Unit

1. Cleaning the Attraction Roller and Attraction Roller Unit (CLC200)

1) Detach the transfer drum unit.
2) While keeping the feeding lever as it is, remove the two screws along the leading edge of the lower feeding assembly (Figure 4-375), and detach the attraction roller cleaning assembly.

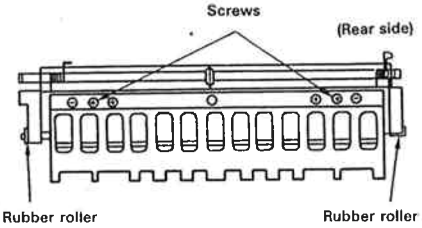


Figure 4-375

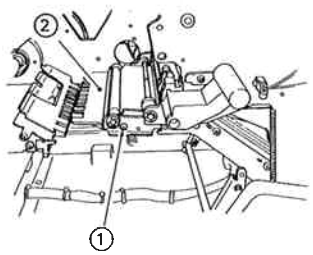
3) Release the feeder lever and clean the attraction roller and the rubber rollers at both ends of the attraction roller with alcohol.
4) If there is soiling on the tip of the scraper, clean the scraper with alcohol.
5) Reset the feeder lever and install the attraction roller cleaner assembly.

Note:
Push the attraction roller cleaner assembly in the direction of the attraction roller and secure the assembly with screws.

1a. Cleaning the Attraction Roller and Attraction Roller Unit (CLC300/350)

1) Detach the transfer drum unit.
2) While keeping the feeding lever as it is, remove the screw along the lower feeding assembly (Figure 4-376), and detach the attraction roller cleaning assembly.

Note:
Remove the screws with care so that the attraction roller cleaner unit will not fall down.



① Screws
② Attraction roller cleaning unit

Figure 4-376

3) Dispose of the waste toner in the waste toner receptacle.
4) Clean the attraction roller and the rollers at both ends of the attraction roller with alcohol.
5) If there is soiling on the tip of the scraper, clean the scraper with alcohol.
6) Install the attraction roller cleaner assembly.

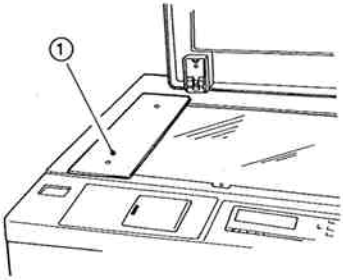
Note:
When attaching the unit, make sure that the positioning pins at the rear and the front are correctly engaged.

IV. SCANNING SYSTEM

A. Scanning System

1. Removing the Scanning Lamp (LA1) and Thermoswitch (THSW2)

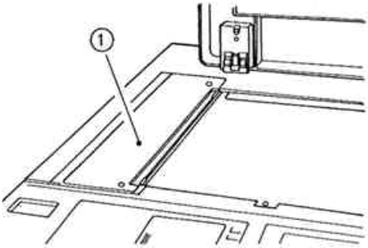
1) Remove the copyboard glass; see Figure 4-105.
2) Remove the size plate (left; 2 screws).



① Size plate (left)

Figure 4-400

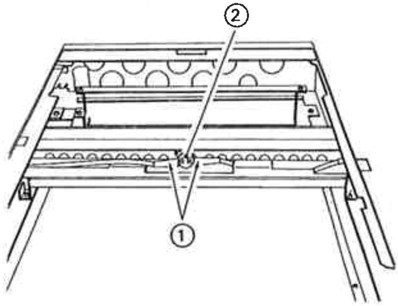
3) Remove the copyboard glass retainer (left; 2 screws).



① Copyboard glass retainer (left)

Figure 4-401

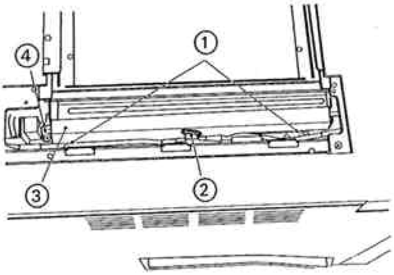
4) Move the mirror 1 mount to create a gap enough to allow a screwdriver.
5) Remove the two screws, and remove the thermoswitch.



① Mirror 1 mount ② Thermoswitch

Figure 4-402

6) Remove the two screws, and remove the light-blocking plate.



① Screws
② Thermoswitch
③ Light-blocking plate
④ Scanning lamp

Figure 4-403

Note:
Do not re-use the thermoswitch once it has been activated.

7) Move the mirror 1 mount fully to the left by hand.
8) Push the scanning lamp to the rear to remove.

Note:
i. Do not hold the scanning lamp by hand; use copy paper.
ii. Do not leave fingerprints or dust on the lens or scanning system.
iii. The light-blocking plate is heated after copy runs; take care.
iv. Make adjustments in the service mode (CCD) whenever the scanning lamp has been replaced.

2. Removing the Scanning System Cable

1) Remove the rear cover, left cover, and upper right cover.
2) Remove the copyboard retainer (right), and remove the copyboard glass.
3) Remove the size plate (left) and copyboard glass retainer (left).
4) Remove the control panel and upper cover.
5) Open the DC controller PCB.
6) Remove the right stay cover, the glass base plate (front), and glass base plate (rear); see Figure 4-404.

Note:
Removal of the glass plates (front, rear) brings all cable of the scanning system into view.

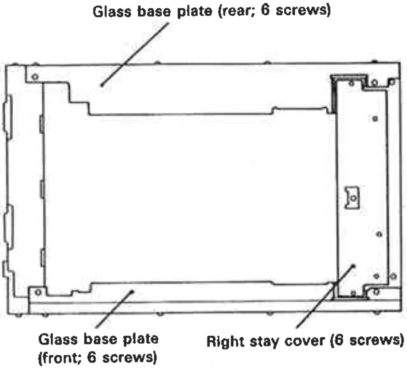

Glass base plate (rear; 6 screws)
Glass base plate (front; 6 screws)
Right stay cover (6 screws)

Figure 4-404 (top view)

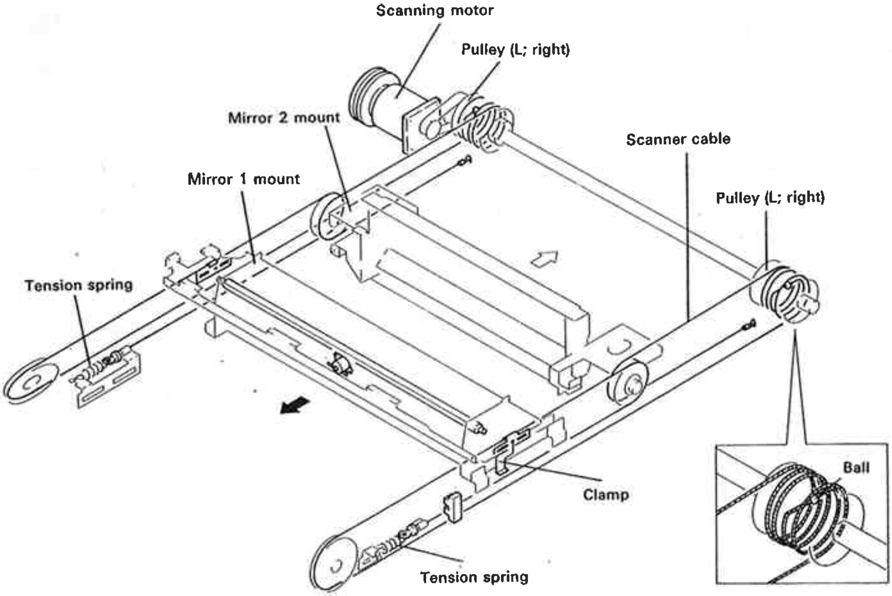

Scanning motor
Pulley (L; right)
Mirror 2 mount
Scanner cable
Mirror 1 mount
Pulley (L; right)
Tension spring
Ball
Clamp
Tension spring

Figure 4-405 CLC200

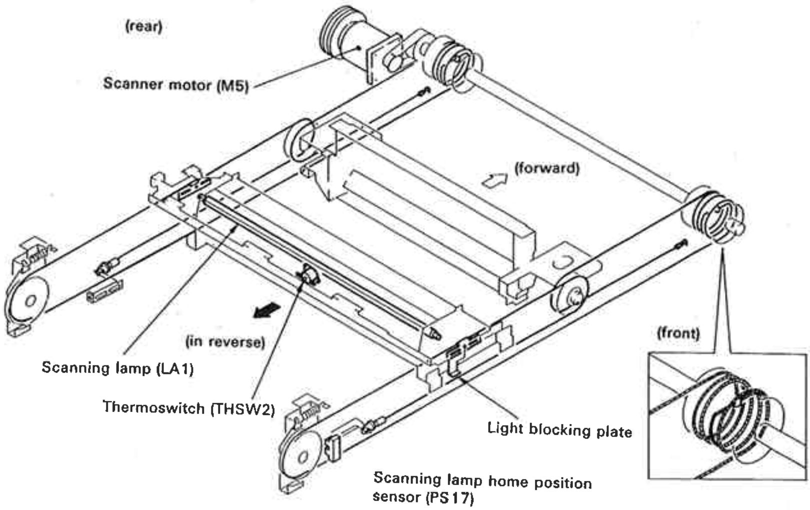
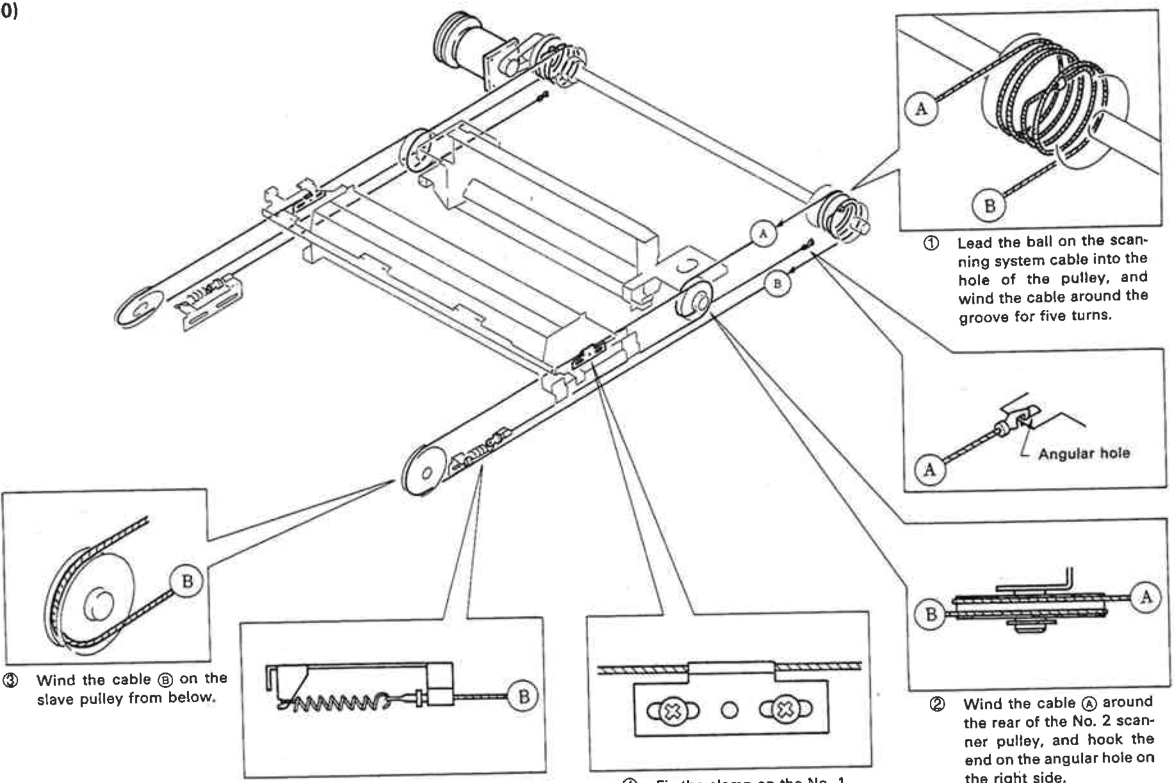

(rear)
Scanner motor (M5)
(forward)
(in reverse)
(front)
Scanning lamp (LA1)
Thermoswitch (THSW2)
Light blocking plate
Scanning lamp home position sensor (PS17)

Figure 4-405a CLC300/350

3. Attaching the Scanning System Cable (CLC200)



① Lead the ball on the scanning system cable into the hole of the pulley, and wind the cable around the groove for five turns.

② Wind the cable Ⓐ around the rear of the No. 2 scanner pulley, and hook the end on the angular hole on the right side.

⑤ Wind the cable Ⓑ on the front of the No. 2 scanner pulley.

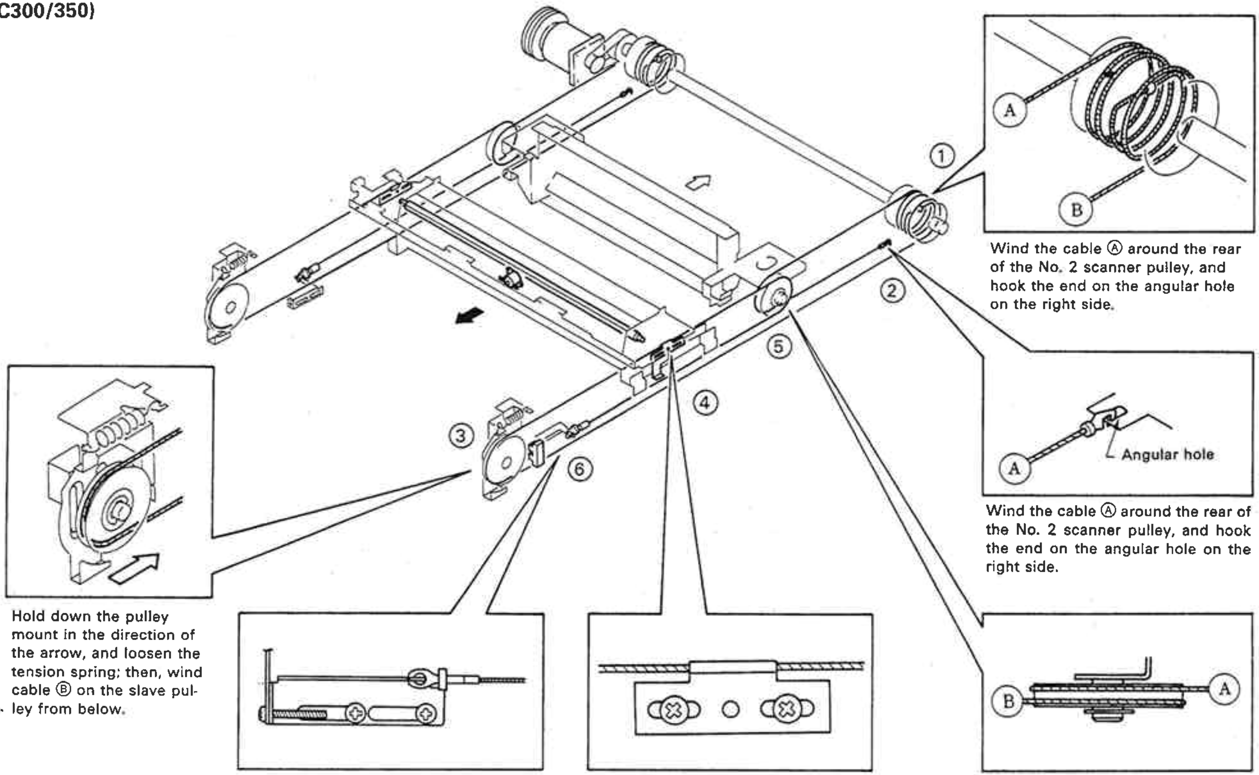
③ Wind the cable Ⓑ on the slave pulley from below.

⑥ Hook the end of the cable Ⓑ on the wire hook by way of the tension spring.

④ Fix the clamp on the No. 1 mirror mount using two screws.

Figure 4-406

3a. Attaching the Scanning System Cable (CLC300/350)



Wind the cable Ⓐ around the rear of the No. 2 scanner pulley, and hook the end on the angular hole on the right side.

Wind the cable Ⓐ around the rear of the No. 2 scanner pulley, and hook the end on the angular hole on the right side.

Hold down the pulley mount in the direction of the arrow, and loosen the tension spring; then, wind cable Ⓑ on the slave pulley from below.

Hook the end of cable Ⓑ on the wire hook while loosening the tension spring of the slave pulley.

Fix the clamp on the No. 1 mirror mount using two screws.

Wind the cable Ⓑ on the front of the No. 2 scanner pulley.

Figure 4-406a

4. Adjusting the Scanning System Cable Tension (CLC200)

Make the following adjustments after attaching the scanning system cable.

1) Loosen the fixing screw on the tension spring bracket.
2) Turn the tension adjusting screw until distance a in Figure 4-407 is 3.0 ±0.4 mm.

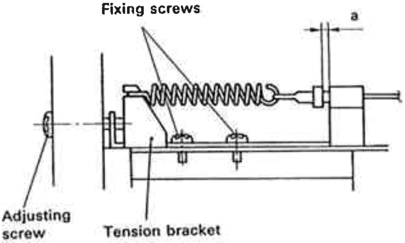


Figure 4-407

Note:
When the adjusting screw is turned clockwise, distance a grows larger and the tension increases.

Note:
i. Check that the scanning system cable is free of twists and it has not overridden the pulley.
ii. Move the mirror No. 1 and 2 mounts by hand to make sure that they move smoothly; do not touch the reflecting plate.

4a. Adjusting the Scanning System Cable Tension (CLC300/350)

The following adjustments need not be made after attachment of the scanner cable.

- Turn the tension adjusting screw fully as shown.

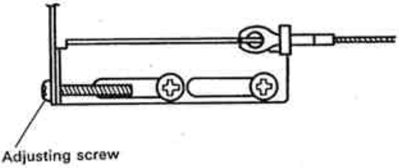


Figure 4-407a

Note:
i. Check that the scanning system cable is free of twists and it has not overridden the pulley.
ii. Move the mirror No. 1 and 2 mounts by hand to make sure that they move smoothly; do not touch the reflecting plate.

5. Adjusting the Mirror Position (optical path between No. 1 mirror mount and Nos. 2 and 3 mirror mount)

1) Move the No. 1 mirror mount and Nos. 2 and 3 mirror mount to the right.
2) Set the mirror positioning tools (front, TKN-0482; rear, TKN-0483) on the rails.

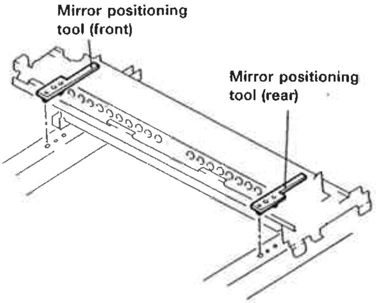

Mirror positioning tool (front)
Mirror positioning tool (rear)

Figure 4-408

3) Loosen the two TP screws on the clamp used to hold the scanning system cable on the No. 1 mirror mount.

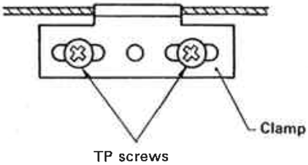


Figure 4-409

4) Move the No. 1 mirror mount and Nos. 2 and 3 mirror mount to the left and against the mirror positioning tool, and tighten the screws loosened in step 3).

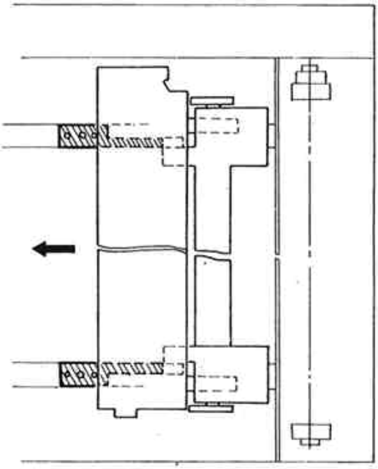
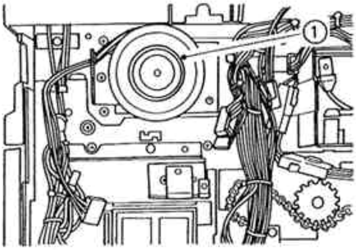


Figure 4-410

5) Detach the tools.

6. Removing the Scanner Motor (M5)

1) Remove the scanner motor driver PCB; see Figure 4-213.
2) Remove the two screws, and detach the motor cover (outside).
3) Remove the three screws, and remove the scanner motor.



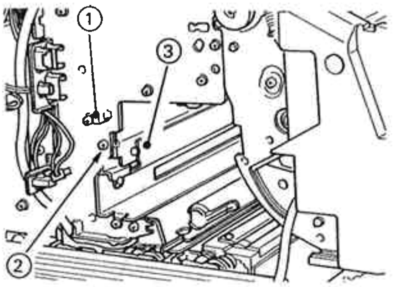
① Scanner motor

Figure 4-411

Note:
Mark the position using a scriber when removing the screws.

7. Removing the Pre-Exposure Lamp (LA2)

1) Remove the photosensitive drum unit; see page 4-39.
2) Disconnect the connector (2P), and remove the screw.



① Connector
② Screw
③ Pre-exposure lamp

Figure 4-412

3) Remove the connector from the front side panel of the machine, and remove the pre-exposure lamp.

8. Stopping Up the Gaps (CLC200 only)

In the case of the CLC200, stray toner, fixing oil vapor, or dust can move into the reader unit through the gap between the reader unit and the printer unit, soiling the No. 1, 2, and 3 mirrors and causing yellow fogging. If the soiling of the mirrors is conspicuous, be sure to stop up the gaps (A through F); thereafter, execute LAMP, GAIN, and WSMP in service mode.

a. Gaps

A: scanner rail (rear), reader base plate, and areas around lens mount PCBs
B: opposite (front) of A above
C (cross section): between reader base plate and lens mount PCB
D: bend on reader rear plate
E: U-shaped opening at reader front side plate
F: lens mount bottom

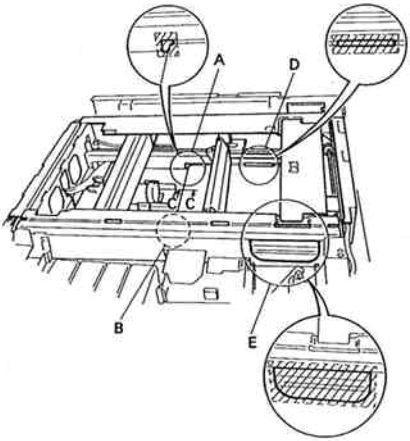


Figure 4-413 Gaps to Stop Up (tape over crosshatching)

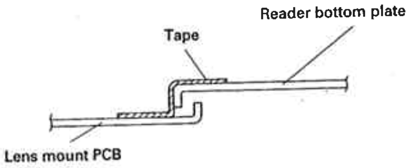


Figure 4-413a Cross Section C

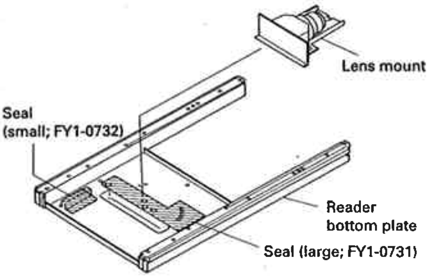


Figure 4-414 Gaps to Stop Up (F)

b. Stopping Up the Gaps
1) Detach the copyboard glass and the shield cover, which protects the lens mount and the analog processor PCB. Figure 4-413 is without the cover; however, you need not detach the cover for work.
2) Clean the areas around the gaps using alcohol to prepare for taping.
3) Cut tape to proper lengths for gaps A through E; FA6-3965 (30×797 mm) and FA6-3966 (20×300 mm) are recommended. Then, stop up the gaps using the tape.
For E, you may tape from inside; you can tape the gap with the upper cover attached.
For F, FY1-0731 or FY1-0732 is recommended.
4) Attach the shield cover and the copyboard glass.

9. Checks and Remedies in the Scanning System

If density discrepancies or fogging is noted along the front/rear on the copies made to correct the problems and if these problems are not noted on test prints, perform the following:

a. Cleaning and Adjustments in Service Mode
1) Clean the scanning lamp, reflector, No. 1, 2, and 3 mirrors, and copyboard glass, and standard white plate.
   - If the mirrors are excessively soiled in the CLC200, stop up the gap along the reader unit as shown in "8. Stopping Up the Gaps".
   - Make sure the bar code does not come into contact with water or solvent when cleaning the CLC350's standard white plate.
2) Execute LAMP, GAIN, and WSMP under CCD in service mode.

b. Replacing the Reflector on the No. 1 Mirror Mount (CLC200/300 only)
1) Replace the upper reflector (FA5-8592) on the No. 1 mirror mount with a CLC350 type (FB1-9541).
2) Execute LAMP, GAIN, and WSMP under CCD in service mode.

c. Adjusting the Height of the Standard White Plate (CLC200/300 only)
1) Add a washer (XD1-1104-133) with a thickness of 0.3 to 0.5 mm under the front or the rear of the glass retainer (FF2-2932) on the left side.

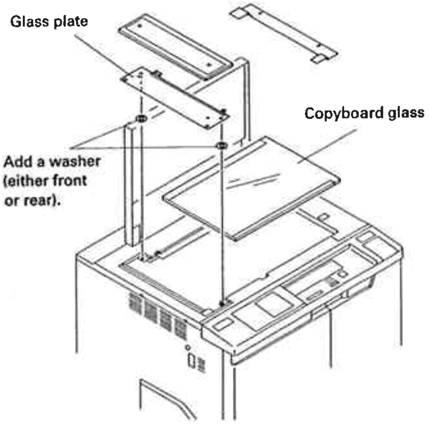


Figure 4-415

V. CORONA SYSTEM

A. Photosensitive Drum Unit

1. Outline

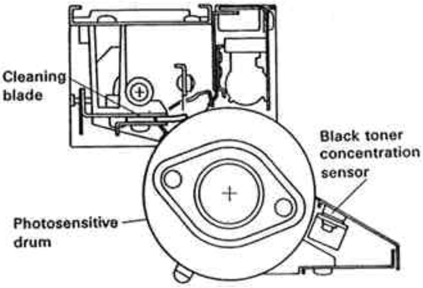
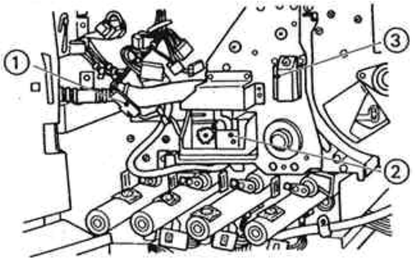


Figure 4-500

> **Note:**
> The photosensitive drum used for the machine is located inside the drum unit; remove the unit first when replacing the drum.

2. Removing the Photosensitive Drum Unit (CLC200)

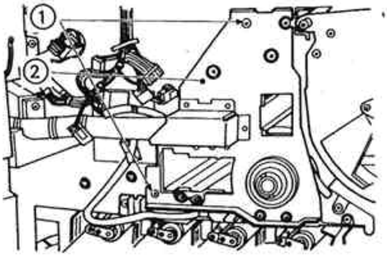
1) Release the transfer drum.
2) Detach the developing duct (upper), and insert a sheet of copy paper; then, open the hopper unit (p. 4-84).
3) Detach the harness that comes from the transfer drum, and disconnect the connector (2P); then, detach the primary corona assembly.
4) Remove the screw, and disconnect the connector (2P), and remove the primary corona unit.
5) Remove the screw, and remove the pre-cleaning corona unit.



① Connector (2P)
② Primary corona unit
③ Pre-cleaning corona unit

Figure 4-501

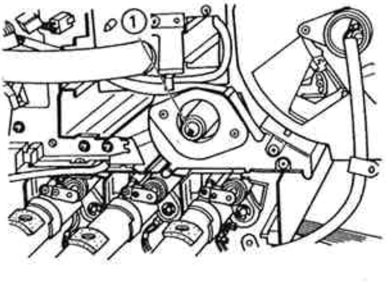
6) Remove the two screws, and remove the photosensitive drum positioning plate.



① Screws
② Photosensitive drum positioning plate

Figure 4-502

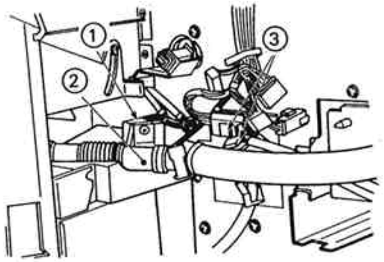
7) Remove the screw, and remove the drum stopper.



① Drum stopper

Figure 4-503

8) Disconnect the two connectors.
9) Check that copy paper is placed on the developing duct, remove the screw, and remove the shutter unit of the cleaner hose from the waste toner cover.



① Screw
② Shutter
③ Connector

Figure 4-504

10) Pull the stop at the tip of the shutter unit to close the shutter unit if it is not equipped with an open/close mechanism.

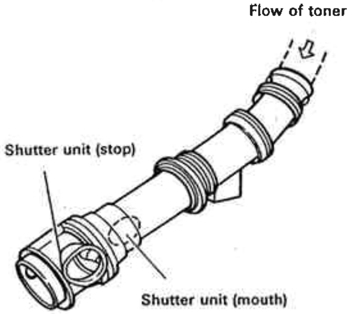


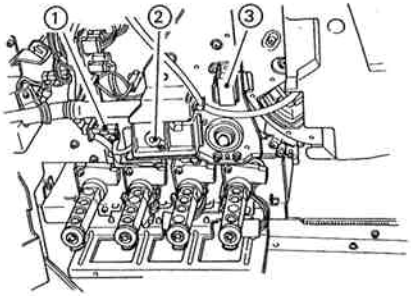
Figure 4-505

11) Remove the photosensitive drum unit toward the front; take extra care.

Note:
If the developing assembly sleeve is directly below the photosensitive drum unit, move the developing shift base by hand to change the position.

2a. Removing the Photosensitive Drum Unit (CLC300/350)

1) Release the transfer drum.
2) Open the hopper unit; see page 4-86.
3) Remove the screw, and detach the developing assembly duct (middle); see Figure 4-604.
4) Place a sheet of paper over the developing assembly duct (lower).
5) Disconnect the connector (2P), and remove the primary corona unit.
6) Remove the pre-cleaning corona unit.

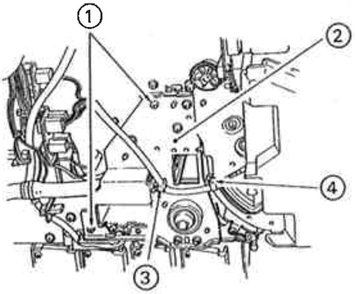


① Connector (2P)
② Primary corona unit
③ Pre-cleaning corona unit

Figure 4-506

7) Detach the harness from the transfer drum; 1 harness retainer and 1 clamp (w/screw).

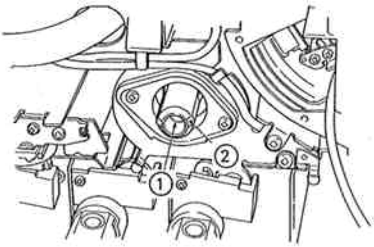
8) Remove the two screws, and remove the photosensitive drum positioning plate.



① Screws
② Photosensitive drum positioning plate
③ Harness retainer
④ Harness clamp

Figure 4-507

9) Remove the screw, and remove the drum stopper from the photosensitive drum shaft.

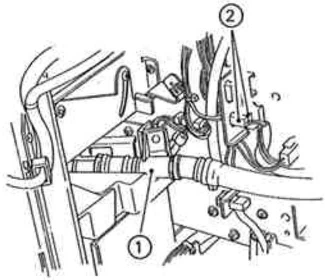


① Drum stopper

Figure 4-508

10) Disconnect the two connectors (2P, 7P).

11) Remove the shutter unit of the cleaner hose from the waste toner cover.



① Shutter
② Connectors

Figure 4-509

12) Pull the stop at the tip of the shutter unit to close the shutter unit.

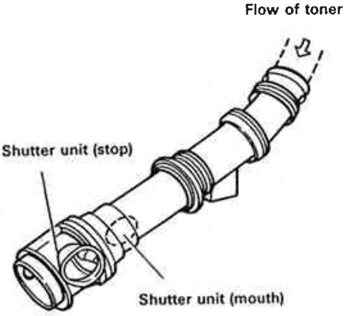


Figure 4-510

13) Remove the photosensitive drum unit toward the front; take extra care.

> **Note:**
> If the developing assembly sleeve is directly below the photosensitive drum unit, move the developing shift base by hand to change the position.

3. Holding the Photosensitive Drum Unit

- Hold the photosensitive drum by the drum flange and its left end.

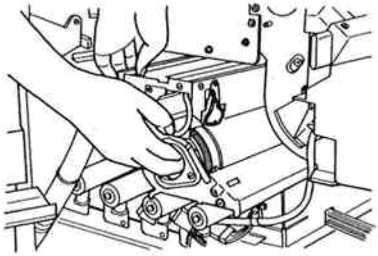


Figure 4-511

Note:
Do not hold the photosensitive drum by its right end; the black toner concentration sensor is located on its right end.

4. Points to Note in Mounting the Drum Unit

The drum unit may be mounted by the foregoing procedure but in reverse; however, take note of the following:

Note:

i. Mount the drum unit on the machine so that the rail on the top of the drum unit slides along the rail on the stay of the machine; see Figure 4-512.
Lift the front end of the unit slightly to facilitate mounting work.

ii. If the drum unit does not slide all the way in, hold the gear of the drum flange, and push the drum unit while turning the drum counterclockwise; do not give the drum more than a 1/4 turn, and do NOT turn it clockwise.

iii. Check that the drum stopper has been mounted before mounting the photosensitive drum positioning plate.

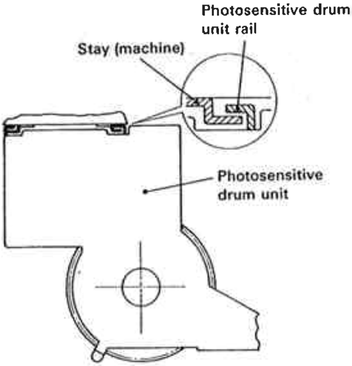


Figure 4-512

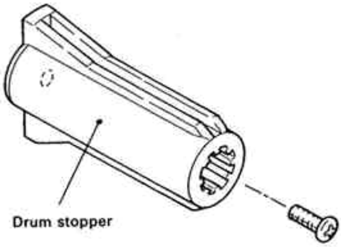


Figure 4-513

5. Removing the Photosensitive Drum

1) Place the photosensitive drum unit on a desk after removing it from the machine; for orientation, see Figure 4-515.

> **Note:**
> i. Place copy paper under the photosensitive drum unit.
> ii. Take care so as to avoid the damage to the photosensitive drum.
> iii. Do not place the photosensitive drum the wrong way; otherwise, the toner will flow off the No.2 blade.

2) Remove the screws (front, rear each), lift the photosensitive drum unit, and remove the toner collection .lid; at the time, dispose of the toner collecting in the No.2 blade unit.

■ Perform step 3); CLC300/350 only.

3) Remove the two screws, and shift up the black toner concentration sensor; then, tape it in place.

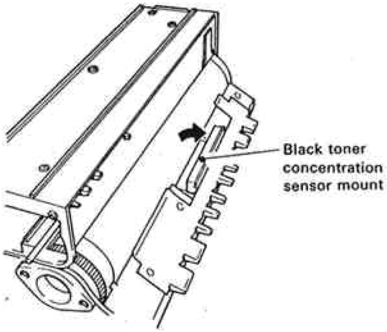


Figure 4-514

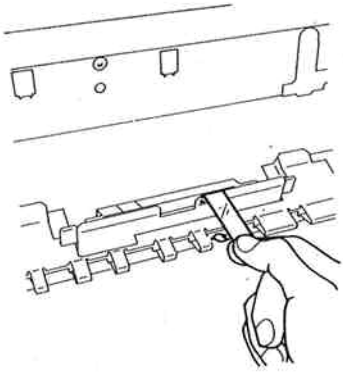


Figure 4-514a

4) Hold the drum unit by hand, and remove the cover from cleaning unit of the photosensitive drum; five screws.

5) Empty the cleaning unit of the photosensitive drum of waste toner.

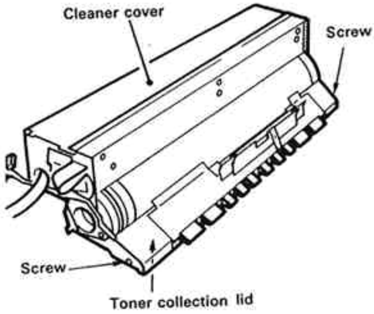


Figure 4-515

6) Place the photosensitive drum unit as shown in Figure 4-516.
7) Remove the two screws each from the front and end, and remove the front and rear drum bushings.

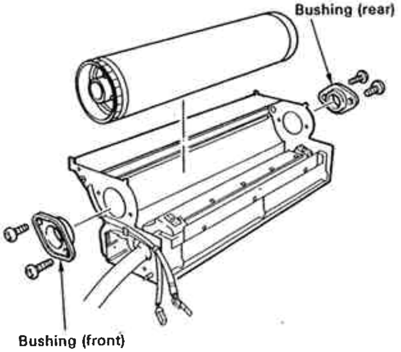


Figure 4-516

8) Lift the photosensitive drum slowly to remove.

Note:
i. Keep the photosensitive drum away from the side seal holder and black toner concentration sensor when removing it.
ii. The photosensitive drum is susceptible to light; exposure to light over a long period of time can lead to white spots or black lines on copies. Keep the photo sensitive drum wrapped in a light-blocking sheet (or copy paper) and keep it in a dark room.

Note:
The photosensitive drum recovers after exposure to light with an intensity of 600 lux for one minute if left in a dark place for 24 hours thereafter. Keep it away from the direct rays of the sun, nevertheless; the rays of the sun is as strong as 10,000 to 30,000 lux.

6. Mounting the Photosensitive Drum

Perform the following when mounting the photosensitive drum:

■ Perform step 1); CLC200 only.

1) Lightly wipe the detection window of the black toner concentration sensor using lint-free paper in one stroke (dry wiping).
Wrap copy paper around the black toner concentration sensor twice so as to cover the entire sensor, and tape it in place. (Be sure the paper is taut without slack.)

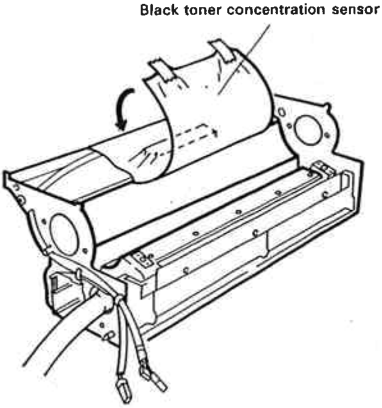


Figure 4-517

2) Apply drum cleaning lubricant (FG2-1694-000) evenly along the No. 2 blade, found behind the toner collection unit.
- Shake the lubricant well before application.
- Apply the lubricant on sides A and B as well as the edge.
- Apply it as if to tap on the blade; do not rub it on the blade to avoid chipping the edge.
- Apply on the surface as well as along the edges of the cushion.

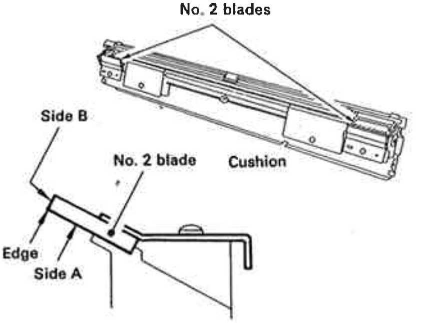


Figure 4-518

3) Shake the drum cleaning lubricant (accessory) well, and apply it along the blade of the photosensitive drum cleaning unit.

- The above need not be done after replacement of the cleaning blade; cleaning blades made available as service parts are already coated with lubricant.
- Make sure that the application is even; otherwise, the copies may carry white vertical lines.
- Be sure to apply the lubricant on sides A and B as well as the blade edge.
- Tap it lightly; do not rub it, or the edge may chip.

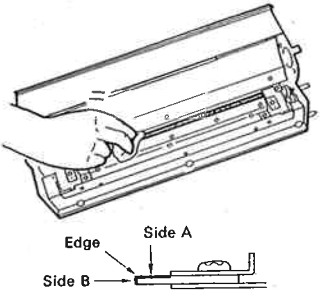


Figure 4-519

4) Place the photosensitive drum in the drum unit, and fix it in place using two bushings (two screws).

- Place it so that the gear of the photosensitive drum is to the side of the waste toner hose.

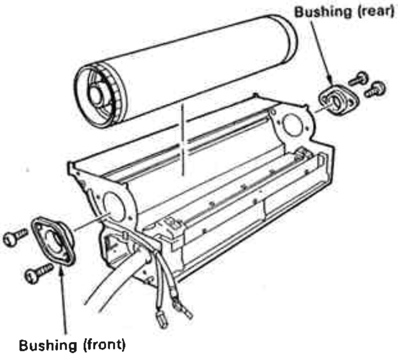


Figure 4-520

■ Perform step 5); CLC300/350 only.

5) Attach the toner collection assembly using 2 screws (No. 2 blade).
6) Turn the drum unit upside down, and place copy paper on a level surface.
7) Check the position of the blade inside the drum cleaner; if not vertical, turn the drive shaft at the rear of the drum cleaning unit to correct it.

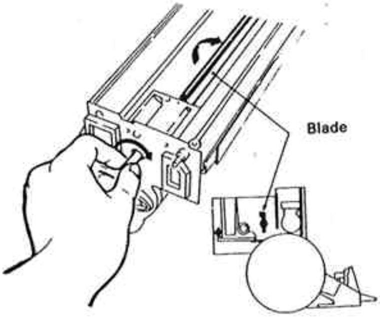


Figure 4-521

8) Shake the drum cleaning lubricant (accessory) well, and remove the cap from the container. Apply a capful (about 5 g) of the lubricant over the drum cleaning unit and the drum so that the amount is the same at the front and rear.

- Take care; if the application is not even, the copies will carry white vertical lines.

9) Mount the cover of the cleaning unit of the drum; see Figure 5-515

10) Shake it right and left as shown in Figure 4-522, and turn it over with care.

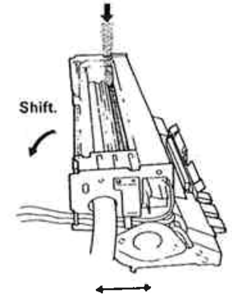


Figure 4-522

11) Hold both ends of the drum, and turn it halfway in directions A and B; repeat this five times.
- A turn over the distance shown in Figure 4-524 four times is equivalent to a half full turn.
- Be sure to turn in direction A first.

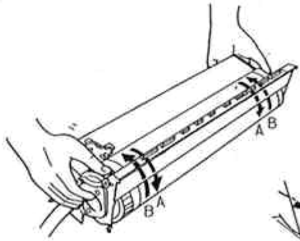


Figure 4-523

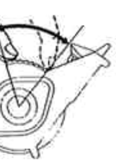


Figure 4-524

12) Give it a further 1/2 turn in the direction of B so that the lubricant is fully returned to the cleaning assembly.

■ Perform step 13); CLC200 only.

13) Detach the copy paper, and attach the toner collection assembly (No. 2 blade).
- Take care to avoid contact between the tape and the photosensitive drum.

■ Perform step 14); CLC300/350 only.

14) Clean the black toner concentration sensor with water or alcohol; use a single stroke.
- Use alcohol with high-purity.
- Do not dry wipe it to prevent spread of dirt.
- Do not touch the photosensitive drum.

■ Perform step 15); CLC300/350 only.

15) Remove the tape used to secure the black toner concentration sensor mount, and fix it in place using two screws.
- Make sure that the sensor has dried.
- Take care so that the tape will not come into contact with the drum.

16) Attach the drum unit to the copier.

17) Re-set 'SGNL-K' (VR981) and 'REF-K' (VR982) under 'ATR-VR'; skip 'ATR-INIT'.

■ Perform step 18); CLC300/350 only.

18) Set SALT to 'SALT-ACT=1', and press the OK key.
- SALT control is executed.

7. Cleaning the Photosensitive Drum

If the surface of the photosensitive drum is soiled, wipe it using flannel cloth (not paper, lint-free or otherwise) coated with toner.

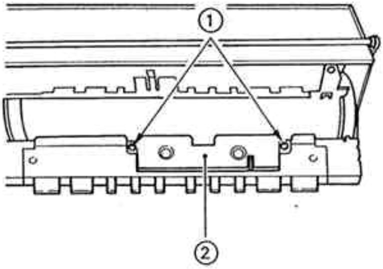
Note:
Do not dry-wipe the drum or use solvents; never use drum cleaning powder.

8. Cleaning the Black Toner Concentration Sensor (CLC200)

Detach the photosensitive drum, and lightly celan it with lint-free paper (dry-wiping, single stroke).

8a. Cleaning the Black Toner Concentration Sensor (CLC300/350)

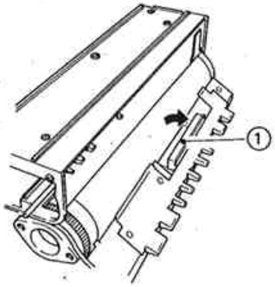
1) Detach the photosensitive drum unit.
2) Remove the two screws shown in Figure 4-525.



① Screws ② Black toner concentration sensor mount

Figure 4-525

3) Lift the black toner concentration sensor mount.



① Black toner concentration sensor mount

Figure 4-526

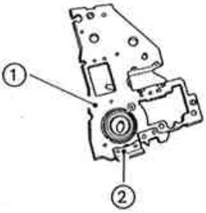
4) Wipe the window of the sensor using lint-free paper moistened with alcohol.

- Use alcohol with high purity.
- Do not dry wipe to prevent spread of dirt.

Note:
- Make sure that the alcohol on the sensor face has completely evaporated before attaching the black toner concentration sensor mount.
- Use *high-purity* alcohol when cleaning the black toner concentration sensor.
- Do not dry wipe the sensor face, or charges may collect on the face.

9. Cleaning the Butting Block

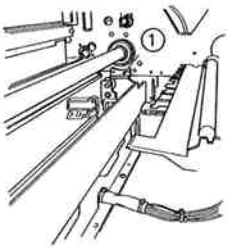
1) Detach the photosensitive drum positioning plate.
2) Clean the bottom of the butting block (front) using alcohol solution.



① Photosensitive drum positioning plate ② Butting block (front)

Figure 4-527

3) Detach the photosensitive drum.
4) Detach the developing assemblies (M,C).
5) Clean the butting block (rear).

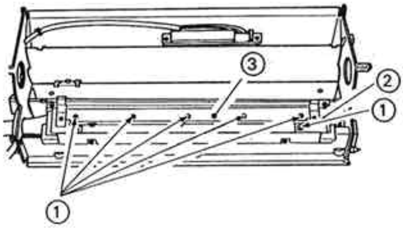


① Butting block (rear)

Figure 4-528

10. Removing the Cleaning Blade

1) Remove the photosensitive drum
2) Remove the screw (left, right), and remove the side seal holder.
3) Remove the five screws, and remove the cleaning blade.



① Screws
② Side seal holder
③ Cleaning blade

Figure 4-529

Note:
Mount the photosensitive drum after having mounting the cleaning blade as discussed in "Points to Note When Mounting the Photosensitive Drum."

11. Points to Note When Mounting the No. 2 Blade

When the No. 2 blade has been turned over or replaced, apply the drum cleaning lubricant as shown in the illustration; **see p. 4-58.**

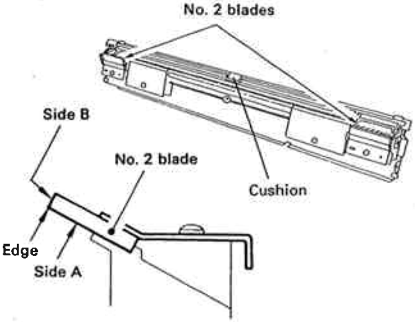
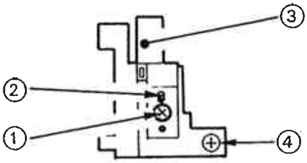


Figure 4-530

12. Removing the Side Scraper and Side Seal

1) Remove the photosensitive drum.
2) Remove the screw ④, and detach the side seal holder.
3) Remove the screw ①, and detach the side scraper/side seal.



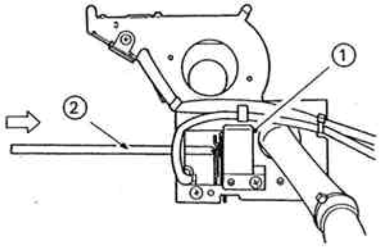
① Screw
② Side scraper (front)
③ Side seal
④ Screw

Figure 4-531

Note:
i. Fix the side seal holder with a gap of 0 to 0.5 mm between the side seal and the end of the cleaning blade; at the time, do not push the side seal against the end of the blade.
ii. Mount the side seal so that its boss is in the hole in the side seal holder and butts against the scraper.

13. Removing the Scoop-Up Sheet

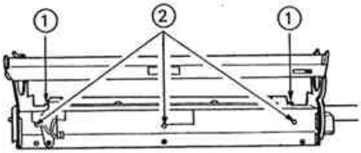
1) Remove the photosensitive drum.
2) Place the photosensitive drum keeping the drum cleaner unit at the bottom.



① Drum cleaner unit ② Screwdriver

Figure 4-532

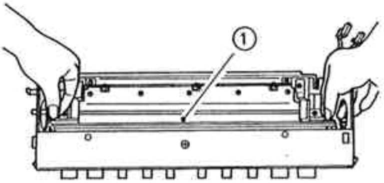
3) Remove the screws, and detach the side seal holder.
4) Insert a screwdriver into the cut-out hole in the direction of the arrow shown in Figure 4-532, and loosen the three screws.



① Side seal holder ② Screws

Figure 4-533

5) Lift the scoop-up sheet to remove.

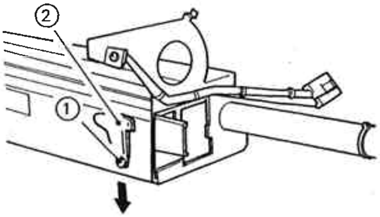


① Scoop-up sheet

Figure 4-534

14. Removing the Drum Thermistor

1) Remove the photosensitive drum unit.
2) Remove the screw, and remove the drum thermistor.



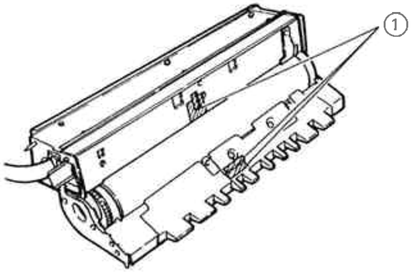
① Screw ② Drum thermistor

Figure 4-535

Note:
When mounting the thermistor, hook the two claws of the thermistor holder in the cut-outs of the shield plate, and screw it in place while pushing it into the direction of the arrow shown in Figure 4-535.

15. Cleaning the Sensor Anti-Glare Sheet

1) Remove the photosensitive drum.
2) Dry wipe the sensor anti-glare sheet (3 points) using lint-free paper; use alcohol solution if necessary.



① Sensor anti-glare sheet

Figure 4-536

Note:
i. Do not touch the photosensitive drum.
ii. The reflecting type sensor of the transfer drum may malfunction if the sensor anti-glare sheet is soiled.

B. Corona Units

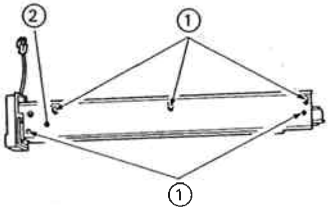
1. Outline

The machine is equipped with seven corona units; the corona wires used for the units are 0.06 mm in diameter.

The grid wire of the primary corona unit is a gold-plated wire 0.1 mm in diameter; the wire, however, may be replaced with bare wire in the field.

2. Removing the Wire Cleaner of the Primary Corona Unit

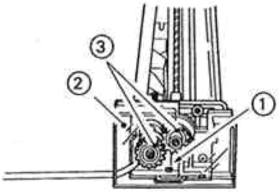
1) Enter the service mode.
2) Select 'FUNCTION' (if CLC300/350, 'F-MISC' of 'FUNCTION'), and select 'WIRE-CL' using the ▽ key.
3) Press the ▷ key to select '2', and press the OK key; the wire cleaner moves to the rear of the primary corona unit.
4) Remove the two screws, loosen the three screws, and remove the corona unit shield plate.



① Screws ② Corona unit shield plate

Figure 4-537

5) Remove the screw, remove the front cover, and remove the two gears.

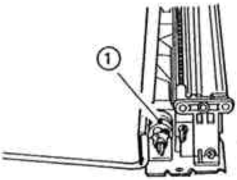


① Screw
② Front cover
③ Gears

Figure 4-538

> **Note:**
> The front cover is equipped with gears; take care not to drop them.

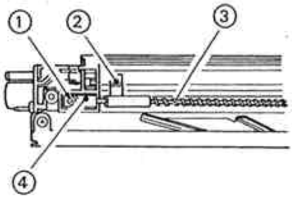
6) Remove the screw from the left shield plate, and detach the motor cover.
7) Remove the primary corona wire cleaning motor.



① Primary corona wire cleaning motor

Figure 4-539

8) Remove the screw, and remove the plate screw retainer plate.
9) Turn the screw by hand, and remove the wire cleaner.



① Screw
② Wire cleaner
③ Screw
④ Screw retainer plate

Figure 4-540

> **Note:**
> The home position of the primary corona wire is at the front; perform the following operations:
> i. Turn the screw by hand to move it to the rear.
> ii. Enter the service mode.
> iii. Select 'FUNCTION' (if CLC300/350, 'F-MISC' of 'FUNCTION'), and select 'WIRE-CL' using the ▽ key.
> iv. Press the ▷ key to select '3', and press the OK key to set the wire cleaner to the front.

> **Note:**
> If the wire cleaner is not positioned correctly, black lines may appear on copies.

3. Attaching the Corona Wires

Except for the grid wire, the corona wires are attached in the same manner for all corona units; the following discussion uses the primary corona unit as an example.

1) Remove the primary corona shield plate; see Figure 4-537.
2) Free a length of about 5 cm from the reel (0.06 mm in wire dia.), and form a loop 2 mm in diameter at the end.

Note:
To form the loop, wind the corona wire around a hex key once, turn the key three to four times, and twist the wire.

3) Cut the excess corona wire on the end using a nipper.
4) Hook the loop on the stud.

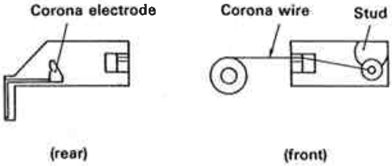


Figure 4-541

5) Hook the corona wire on the corona wire positioner at the rear, and hook the corona wire tension spring on the corona wire; thereafter, twist the wire.

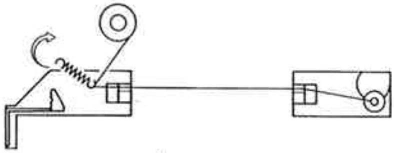


Figure 4-542

6) Cut the excess wire using a nipper.
7) Pick the end of the corona wire tension spring using tweezers, and hook it on the corona electrode.

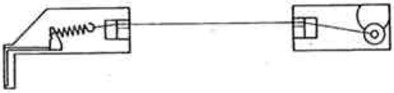


Figure 4-543

Note:
i. Check that the corona wire is free of bends or twists and its gold-plating has not peeled.
ii. Check that the corona wire is in groove of the corona wire positioner.

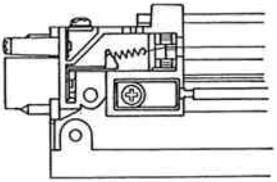


Figure 4-544

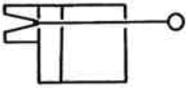


Figure 4-545

8) Wet lint-free paper with alcohol, and wipe the primary corona wire with it.

4. Attaching the Grid Wire of the Primary Corona Unit

1) Loosen fixing screw ⓐ of the primary corona unit block, and decrease the tension of the grid wire using screw ⓔ; see Figure 4-547.
2) Free a length of about 5 cm from a corona wire reel (Y81-0162-000; 0.1 mm wire dia.), and form a loop 2 mm in diameter at its end.

Note:
To form the loop, wind the corona wire around a hex key once, and turn the key four to five times.

3) Cut the excess corona wire on the end to 1 mm or less using a nipper; hook the loop on boss ⓕ shown in Figure 4-546 and route the wire in the order shown in Figure 4-547.
4) Hook the end of the corona wire on the stud when it has been routed as shown in Figure 4-547, and wind it around screw ⓖ and fix it.
5) Cut the excess corona wire to 1 mm or less using a nipper.
6) Turn screw ⓔ so that distance ⓓ between ⓑ and ⓒ shown in Figure 4-546 is 0.5 mm.
7) Dry-wipe the grid wire.

Note:
i. Check that the grid wire is free of bends or twists and its gold plating has not peeled.
ii. Check that the wire is routed at equal intervals, i.e., the wire is in the groove of the block.

8) Fix screw ⓐ.

Note:
The tension of the grid wire increases when adjusting screw ⓔ is turned clockwise.

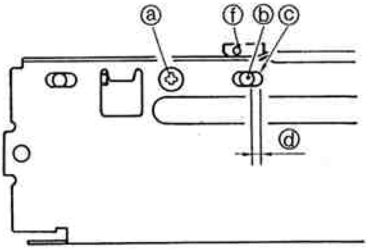


Figure 4-546

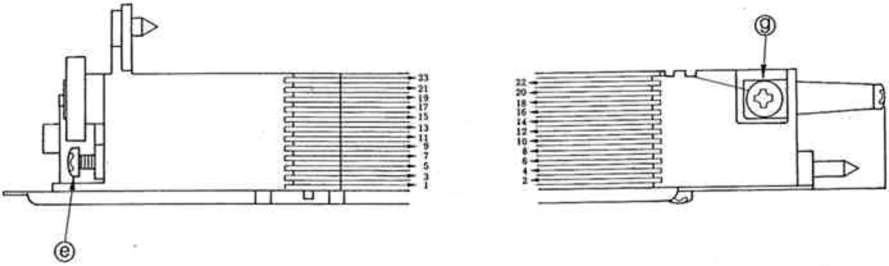


Figure 4-547

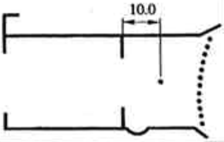
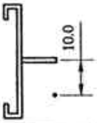
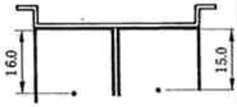
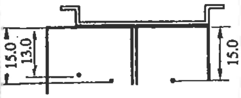
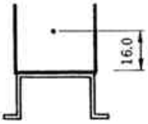
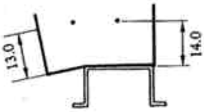
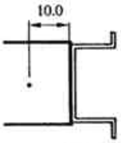
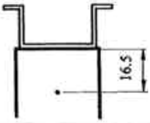
Corona unit	Height of corona wire (mm)	Adjustable (mm; approx.)
Primary corona unit		4
Pre-cleaning corona unit		4
External static eliminator/ separation corona unit (CLC200)		4
External static eliminator/ separation corona unit (CLC300/ 350)		4
Internal static eliminator corona unit (CLC200)		4
Internal static eliminator corona unit (CLC300/ 350)		4
Transfer corona unit		—
Attraction corona unit		—

Figure 4-548

Note:

i. The height of each corona wire can be adjusted by turning the screw behind the corona unit*; a full turn of the screw changes the position of the corona wire by about 0.7 mm.

ii. Release the push-on sheet (transfer) when sliding the transfer corona unit in and out of the transfer drum unit; see Figure 4-339 and 353.

* The adjustment is not necessary for the transfer corona unit or the attraction corona unit.

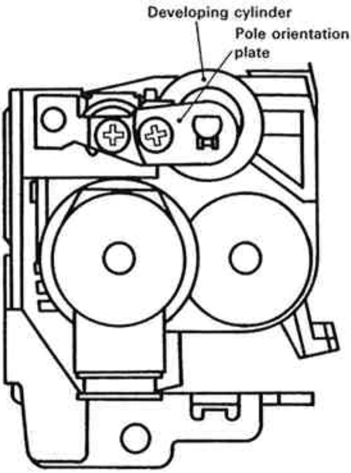
iii. Adjust the height of the transfer corona wire depending on the presence/absence of the metal plate along the leading edge of the attraction push-on sheet.

Attraction Push-On Sheet	Height of Transfer Corona Wire
w/o metal plate (FF2-2835)	10.5±0.2 mm
w/ metal plate (FF2-5746)	10.0±0.2 mm

VI. DEVELOPING SYSTEM

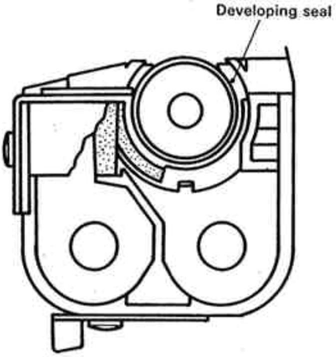
A. Developing Assembly

1. Construction



(front view)

Figure 4-600



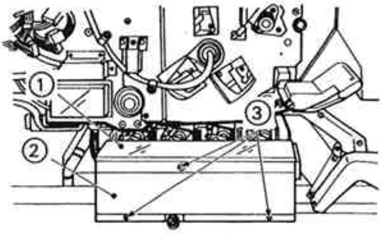
(cross section)

Figure 4-601 (cross section)

2. Removing the Developing Assembly (CLC200)

All developing assemblies have the same construction and can be removed in the same manner.

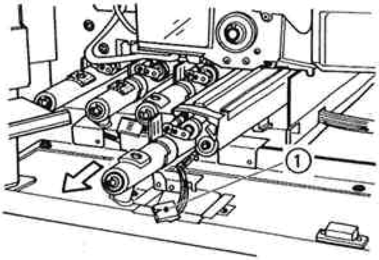
1) Open the hopper unit; see page 4-84.
2) Remove the screw, and remove the developing duct (middle).
3) Remove the two screws, and remove the developing duct (lower).



① Developing duct (middle)
② Developing duct (lower)
③ Screws

Figure 4-602

4) Remove the screw that holds the developing assembly in place.
5) Disconnect the connector, move the developing assembly somewhat to the left, and pull it out toward the front.



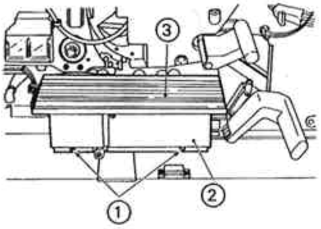
① Connector

Figure 4-603

2a. Removing the Developing Assembly (CLC300/350)

All developing assemblies have the same construction and can be removed in the same manner.

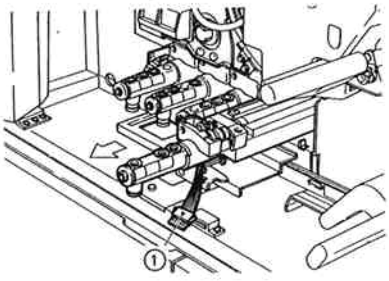
1) Open the hopper unit; see page 4-86.
2) Remove the two screws, and remove the developing duct (middle, lower); lift the front of the duct.



① Developing duct (middle)
② Developing duct (lower)
③ Screws

Figure 4-604

3) Remove the screw that holds the developing assembly in place.
4) Disconnect the connector, move the developing assembly somewhat to the left, and pull it out toward the front.



① Connector

Figure 4-605

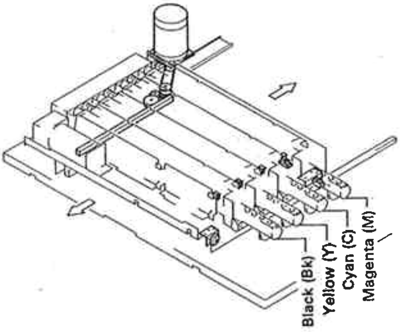


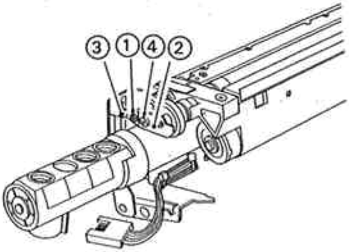
Figure 4-606

Note:

i. The developing assemblies are arranged as shown in Figure 4-606; they cannot be mounted in an arrangement other than that shown.
ii. The black developing assembly is not equipped with a toner concentration sensor; the one in the photosensitive drum unit serves the purpose.
iii. Each developing assembly has its toner supply opening shaped differently from that of the other developing assemblies; this is in consideration of the toner hopper openings, which are positioned apart.
iv. Lay copy paper when placing the developing assembly.
v. When carrying or placing the developing assembly, keep it level without tilting; otherwise, the developer inside it can shift, causing the cylinder or screw to lock up.

3. Removing the Developing Cylinder

1) Detach the pole orientation cover 1 plastic screw.
2) Remove the screw, and remove the pole orientation plate together with the positioning plate.



① Screw
② Pole orientation
③ Positioning plate
④ Paint lock

Figure 4-607

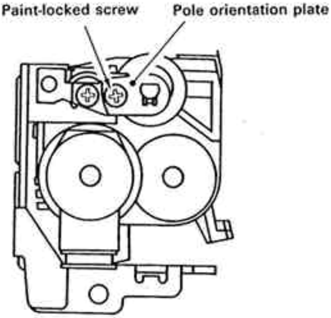
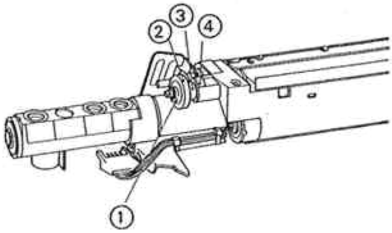


Figure 4-608

> **Note:**
> Do not remove screw ④ (paint-locked); further, note that the pole orientation plate is not interchangeable among developing assemblies.

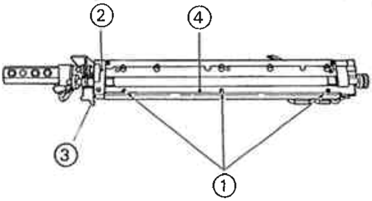
2) Remove the grip stop ring, stop roller, and bearings and spacer.



① Grip stop ring
② Stop rollers
③ Spacer
④ Bearing

Figure 4-609 (front)

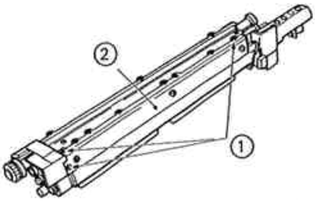
3) Remove the four screws, and remove the high-pressure plate cover and right cover.



① Screws
② High-pressure plate cover
③ Screw
④ Right cover

figure 4-610

4) Remove the three screws, and remove the left stay.

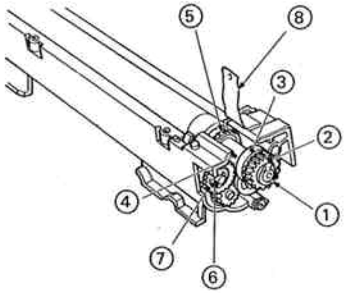


① Screws
② Left stay

Figure 4-611

Note:
The inside of the left stay is equipped with a toner concentration sensor (not for Bk); take care not to touch the Teflon sheet or damage it.

5) Detach the tape (hook), remove the E-ring, grip ring, three gears, and bearings and stop roller.

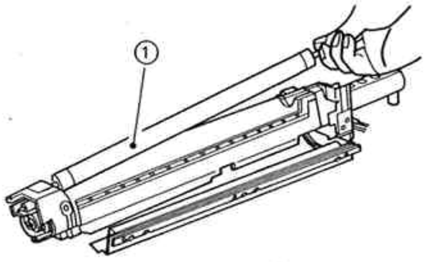


① Grip ring
② Gear
③ Stop roller
④ Gear
⑤ Bearing
⑥ E-ring
⑦ Gear
⑧ Tape

Figure 4-612

Note:
The gear ⑤ is equipped with a pin; take car not to drop it.

6) Pull out the developing cylinder with care.



① Developing cylinder

Figure 4-613

Note:
Do not leave fingerprints or oils on the developing cylinder; dry-wipe it using lint-free paper, if necessary.

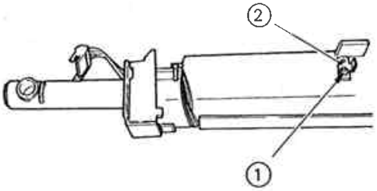
If copies prove to be too light as a result of dry-wiping, wipe it again with moist lint-free paper; do not use solvents.

4. Attaching the Developing Assembly (CLC300/350 only)

The M, C, and Y developing assemblies of CLC300/350 may be used to serve as an assembly for other colors. Follow the steps below to switch the assemblies.

Note:
The BK developing assembly, without a toner concentration sensor, does not permit use as an M, C, or Y developing assembly.

1) Remove the screw, and replace the foolproof plate under the developing assembly with one for the desired assembly (color).



① Screw
② Foolproof plate

Figure 4-614 (viewed from below)

2) Adjust the lid on the toner supply mouth so that the one with the desired color will open; i.e., check the color of the seal on the mouth.

Note:
i. Make sure that the developing assemblies are protected against dust when storing them.
ii. Do not use the assemblies used once for a different color.
iii. Make sure that the lid on the toner supply mouth is correctly positioned.

5. Points to Note in Assembling the Developing Assembly

i. Take care so that the positioning pin of the developing assembly will not be subjected to excessive force when mounting the left stay; further, push it in the direction of the arrow (Figure 4-615) when fixing it in place.

ii. Check that the distance between the stop roller and grip ring is 0.1 ±0.1 mm.

iii. The screws should not be used interchangeably; ① is non-magnetic and ②, magnetic.

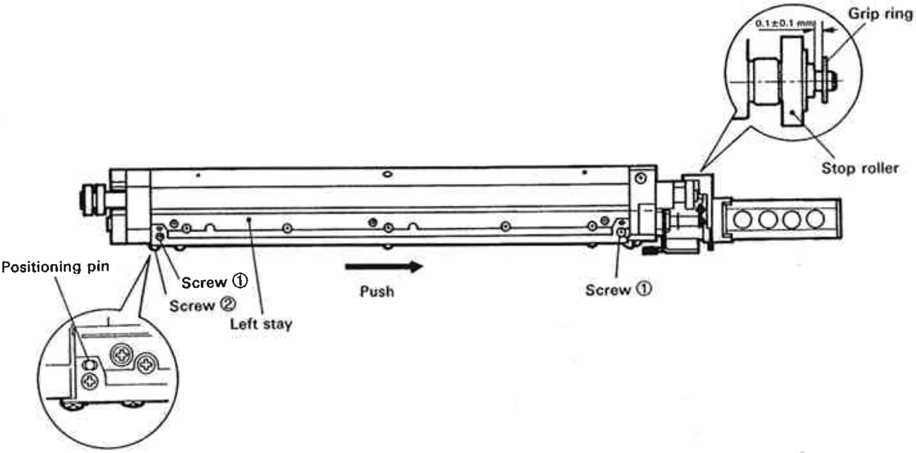
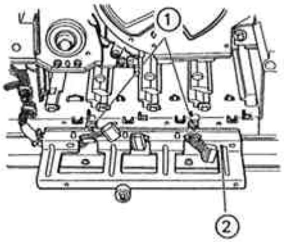

0.1±0.1 mm
Grip ring
Stop roller
Positioning pin
Screw ①
Screw ②
Left stay
Push
Screw ①

Figure 4-615

6. Removing the Developing Assembly Shift Base

1) Remove the developing duct from the machine, and remove each developing assembly.
2) Remove the two screws, and place the connector wire plate on the shift base.

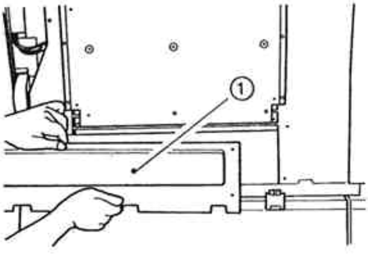
Note:
Take care not to damage the photosensitive drum.



① Screws ② Connector wire mount plate

Figure 4-616

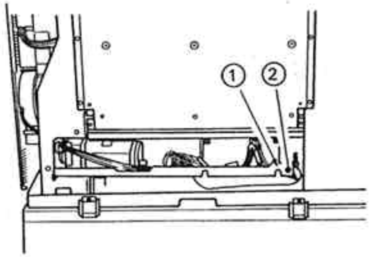
3) Remove the left cover.
4) Remove the six screws, and remove the lower left cover.



① Lower left cover

Figure 4-617

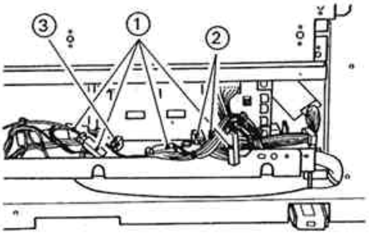
5) Remove the screw, and remove the bracket of the unit harness.



① Screw ② Bracket

Figure 4-618

6) Disconnect the four developing cylinder drive clutch connectors (2P), developing assembly drive motor connector (2P), and two connectors (J901, J902) on the color toner concentration adjusting PCB.



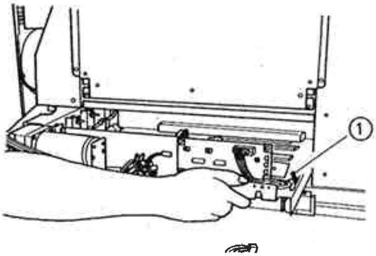
① Clutch connectors ③ Motor connector
② Color toner concentration adjusting PCB connectors

Figure 4-619

Note:
Mark the four clutch connectors (2P) when disconnecting them for later identification.

7) Slide the developing assembly shift base, and lift it to remove.

Note:
Take care not to damage the photosensitive drum and the harness found in front of the shift base.



① Developing assembly shift base

Figure 4-620

Note:
i. Check that all connectors are identified and set correctly.
ii. Check that the developing assembly shift base is set along the rear and front rails of the machine; see Figure 4-621.
iii. Move the developing assembly shift base to the right and left by hand, and check that the unit harness does not come into contact with the rails.

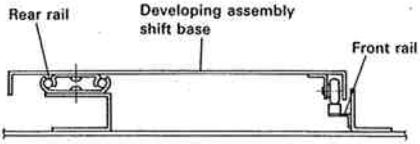

Rear rail
Developing assembly shift base
Front rail

Figure 4-621

iv. If the tape used to prevent injuries is not found as shown in Figure 4-622, attach it.

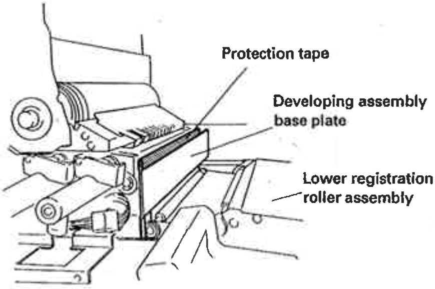
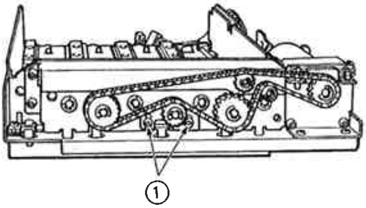

Protection tape
Developing assembly base plate
Lower registration roller assembly

Figure 4-622

7. Removing the Developing Cylinder Clutches (CL1 through CL4)

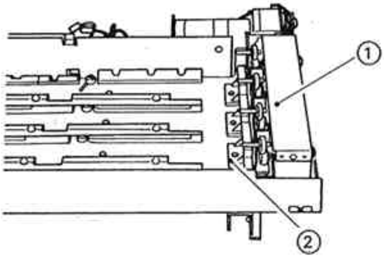
1) Loosen the two screws, and detach the chain.



① Screws

Figure 4-623

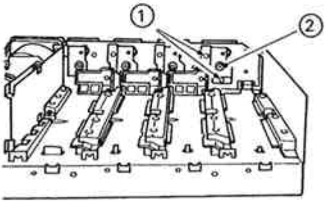
2) Remove the screw, and detach the clutch cover; then, remove the two screws, and detach the developing assembly support.



① Clutch cover ② Developing assembly support

Figure 4-624

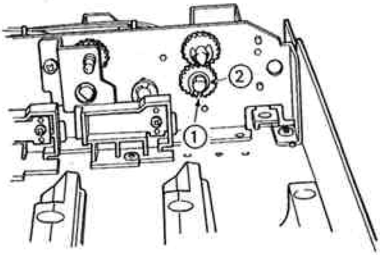
3) Remove the E-ring and two screws, and remove the bracket and leaf spring.



① Screws ② Bracket

Figure 4-625

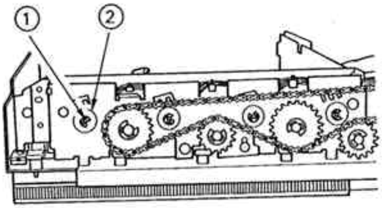
4) Remove the grip ring, and remove the gear and bushing.



① Grip ring ② Gear

Figure 4-626

5) Remove the E-ring, loosen the set screw of the clutch, and remove the clutch shaft and bushing.



① Clutch shaft ② Bushing

Figure 4-627

6) Disconnect the connector of the clutch, and remove the clutch.

8. Replacing the Developer

1) Open the hopper unit; see page 4-84 or 86.
2) Remove the developing ducts (middle).
3) Detach the developing unit cap.
4) Remove the pole orientation plate cover.

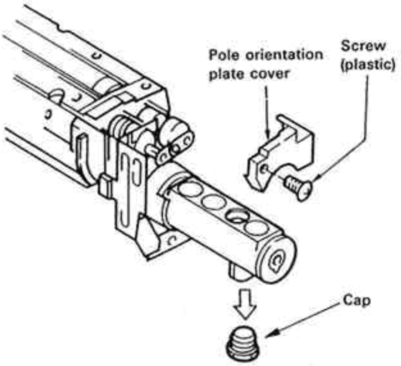


Figure 4-628

5) Remove the screw from the pole orientation plate of the developing unit, turn the pole orientation plate around the developing cylinder shaft, and hook it against the bottom of the pin; see Figure 4-629.
- The angle of polarity of the developing cylinder can be varied by the above operation; this will prevent the developer from overflowing when the cylinder is turned in reverse.

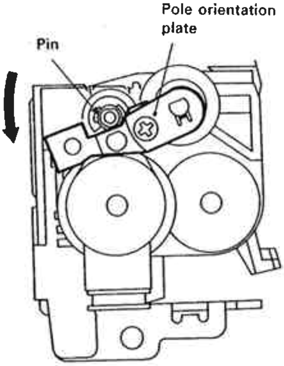


Figure 4-629

6) Enter the service mode.
7) Select 'FUNCTION', and select 'TONER-RECV'.
8) Press the ▷ key to select the developing assembly from which toner is to be drawn out; 0 → M → C → Y → BK.

Note:
To replace toner in all developing assemblies, select M, C, Y, and BK in the order named.

9) Press the OK key.
- The operation will complete itself in three minutes.
- If developer blocks the outlet, level the excess developer with a sheet of copy paper.
- If developer overflows from the developing duct (lower), press the "C/⊘" key and put the developer in the developing duct (lower) into a vinyl bag.

10) Insert the developing unit cap and remove the developing duct (lower).
11) Remove the developing assembly (one screw and one connector), then remove the developing unit cap.
12) Turn the gear manually while tilting the developing assembly and remove the remaining developer. When doing this, gradually tilt the developing assembly more and more while turning the gear until no developer appears, even with the developing assembly vertical.

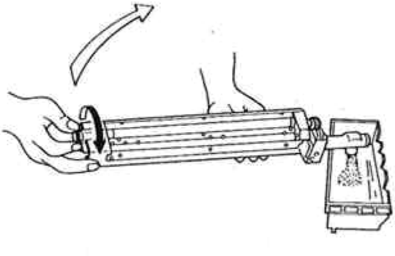


Figure 4-630

13) Insert the developing unit cap.
14) Place the pole orientation plate over the pin and fix it with one screw.
15) Install the pole orientation plate cover.
16) Put the developer in the developing duct (lower) into a vinyl bag and install the developing assembly and developing ducts (lower and middle).

17) Select 'TONER-SPLY'.
18) Press the ▷ key, and choose the developing assembly into which the toner is to be poured (0 → M → C → Y → BK).
19) Press the OK key.
- The developing assembly moves after about 15 seconds and the selected developing assembly screw rotates.

20) Pour developer into the developing assembly whose screw is rotating.
- The developing assemblies are arranged in the following order:
  M: magenta
  C: cyan
  Y: yellow
  BK: black
- Tilt the developer bottle while turning it.
- Note that the developing assembly automatically returns to the home position after about 5 minutes.

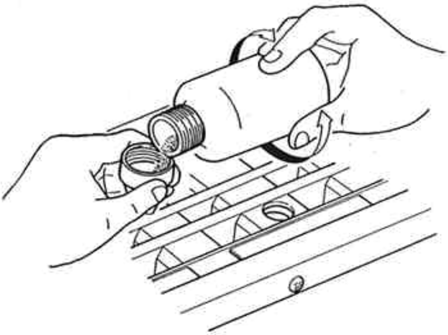


Figure 4-631

21) Press the C/⊘ key to stop the operation.
22) Make adjustments under 'ATR-VR' and 'ATR-INIT'.

■ In the case of the CLC300/350, perform steps 23) and 24).

23) Set 'SALT-ACT=1' under 'SALT', and press the OK key.
- SALT control is executed.

24) Execute 'INIT=K' if the black developer has been replaced.

9. Replacing the oil seal (CLC200 only)

The oil seal must be replaced when the developer is replaced.

1) Draw out the developer.
2) Put the developing assembly on a sheet of copy paper.
3) Remove the E-ring, and remove the 16-tooth gear and the two-15-tooth gears.

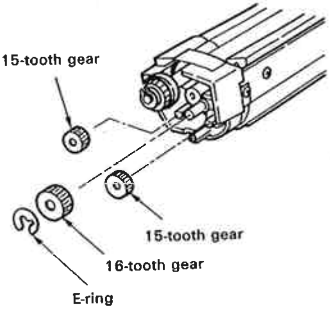


Figure 4-632

4) Cut the cable band on the front using wire cutters.

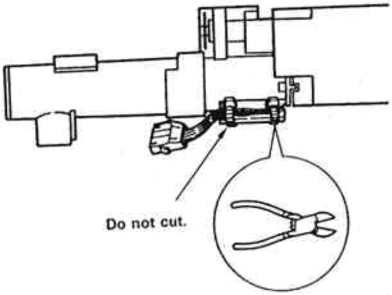


Figure 4-633

5) Remove the four E-rings at both ends of the screw shaft.
6) Remove the two screw caps on the front side and pull out the screws one by one toward the front.
- Take care; any developer still in the developing assembly may leak.

7) Put the developer still in the developing assembly in a plastic bag.
8) Pull out the two screw caps on the rear side.
- Be careful not to damage the insides of the screw caps.

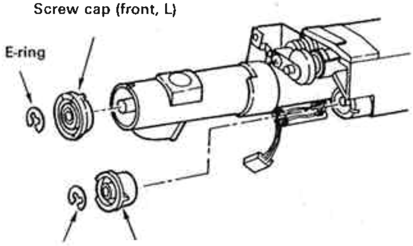


Figure 4-634

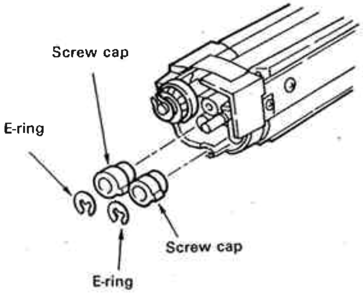


Figure 4-635

Note:
The screw cap used at the rear comes in two types (old, new); if it is of the new type, skip steps 9) and 10), as it can be removed together with the oil seal.

9) Insert end A of the oil seal extraction tool (FA6-6453-000; accessory) into the shaft hole crear of the developing assembly, then pull the tool out.
- The rear-side oil seal attaches to the tool and the oil seal will be removed.

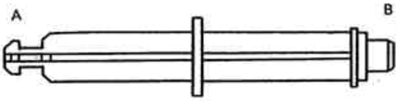


Figure 4-636 Oil Seal Extraction Tool

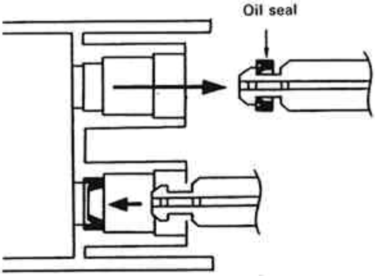


Figure 4-637

10) Put a new oil seal on end B of the extraction tool, and insert the tool into the axis hole.
- Make sure the oil seal is positioned correctly.

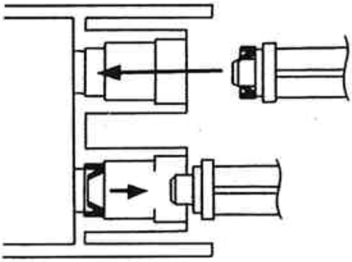


Figure 4-638

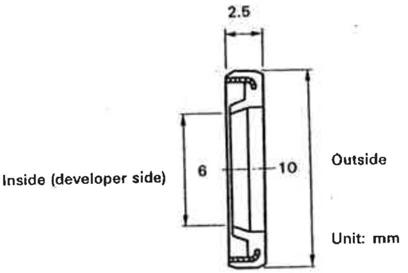

2.5
Inside (developer side)
6
10
Outside
Unit: mm

Figure 4-639

11) Remove the bearing from the screw cap (front, L) removed in step 6).

12) Remove the oil seal from the bearing and screw cap (front, S) using a flat-bladed screwdriver.
- Be careful not to damage the inside of the bearing or the screw caps.

13) Push a new oil seal into the bearing and screw cap (front, S) with the tip of a finger.
- Make sure the oil seal is positioned correctly; see Figure 4-639.
- Be careful not to damage the oil seal with nails.

14) Put the bearing into the screw cap (front, L).

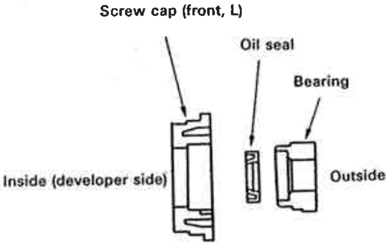

Screw cap (front, L)
Oil seal
Bearing
Inside (developer side)
Outside

Figure 4-640 Screw Cap (front, L)

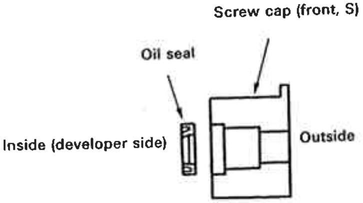

Screw cap (front, S)
Oil seal
Inside (developer side)
Outside

Figure 4-641

15) Insert the two screw caps (rear) into the developing assembly.

16) Insert the screw (L) while holding the rear screw caps, and install the other screw cap (front, L).

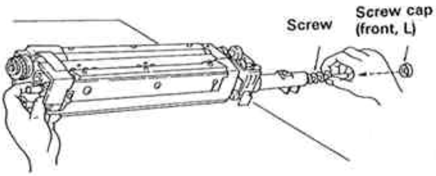

Screw
Screw cap (front, L)

Figure 4-642

17) Push the screw shaft and move the screw back and forth by 5 mm several times.
- Be sure to move the screw to prevent the oil seal from coming off.

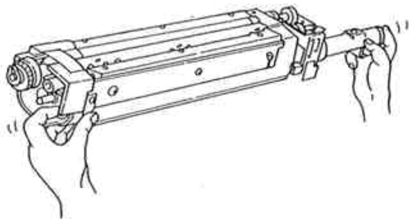


Figure 4-643

18) Attach the other screw (S) in the same way as the first screw (L).

19) Attach the gear and cable band.

20) Put in the developer.

10. Cleaning the Screw Cap (CLC300/350 only)

The machine's screw caps and the magnetic seal are constructed as a single entity.

The screw cap must be cleaned every two replacements of developer.

1) Draw out the developer.
2) Put the developing assembly on a sheet of copy paper.
3) Remove the E-ring, and remove the 16-tooth gear and the two-15-tooth gears.

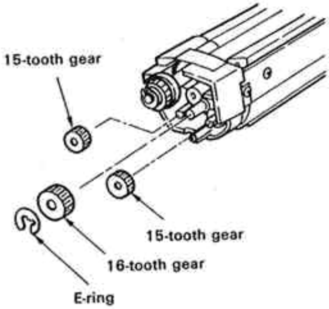

15-tooth gear
15-tooth gear
16-tooth gear
E-ring

Figure 4-644

4) Cut the cable band on the front using wire cutters.

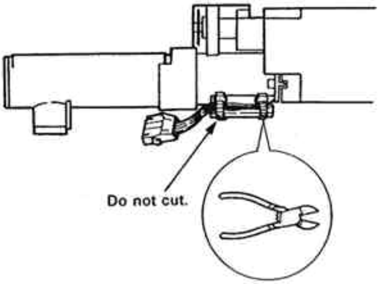


Figure 4-645

5) Remove the four E-rings at both ends of the screw shaft.
6) Remove the two screw caps on the front side and pull out the screws one by one toward the front.
- Take care; any developer still in the developing assembly may leak.
7) Put the developer still in the developing assembly in a plastic bag.
8) Pull out the two screw caps on the rear side.
- Be careful not to damage the insides of the screw caps.

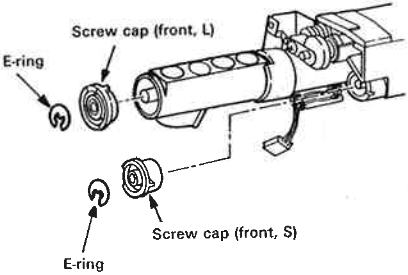

Screw cap (front, L)
E-ring
E-ring
Screw cap (front, S)

Figure 4-646

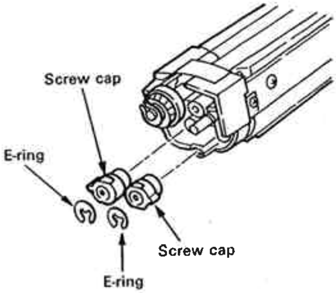

Screw cap
E-ring
Screw cap
E-ring

Figure 4-647

9) Clean the screw cap as follows:
9-1) Remove the toner from inside the screw cap.
9-2) Remove the toner from the edge shown in the illustration.

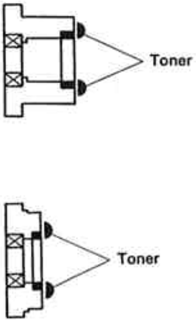


Figure 4-648

9-3) Move it inside the ring, if necessary, to remove the carrier from the end.

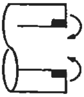


Figure 4-649

10) Insert the two screw caps (rear) into the developing assembly.
11) Insert the screw (L) while holding the rear screw caps, and install the other screw cap (front, L).

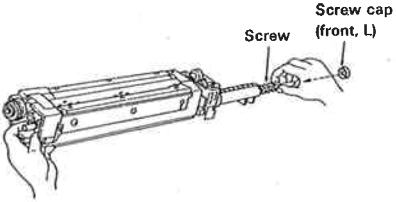


Figure 4-650

12) Attach the other screw (S) in the same way as the first screw (L).
13) Attach the gear and cable band.
14) Put in the developer.

11. Adjusting the Cylinder Drive Chain Tension

When the cylinder drive chain becomes slack, it tends to skip sprocket teeth, causing abnormal sounds, blurs, or white lines. To correct this, adjust the tension as follows:

1) Open the front door, and slide the developing assembly base to the right end.
2) Remove the rear cover, loosen the two screws; and pushing the sprocket up as shown in the following figure, tighten the screws.

- When the sprocket is pushed up, part A of the chain should be taut. Do not use too much force.

If the teeth frequently skip along the chain on the developing assembly base (old type), replace the parts with the following:

drive chain: XF9-0370-000
upper cover: FF2-4192-000
11T sprocket (2 pcs.): FS2-3210-0000
18T sprocket (1 pc.): FS1-0545-000

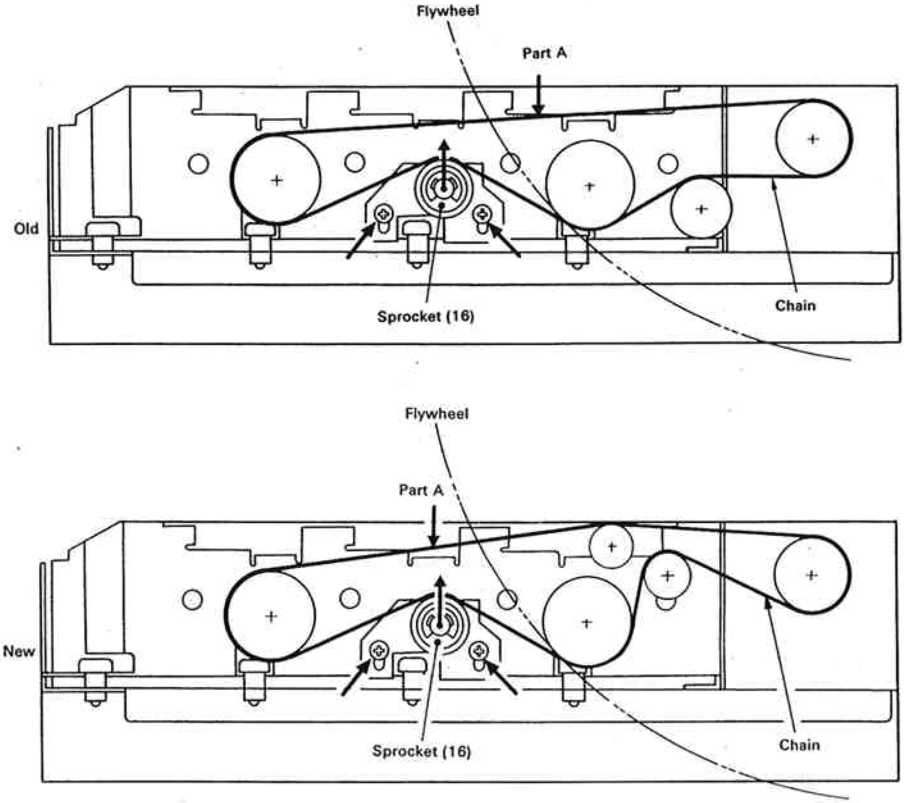


Figure 4-651

12. Paint Locking the Return Spring on the Developing Assembly Pressure Spacer

The return spring on the developing assembly pressure spacer can become displaced, causing E021. If this happens, fix the spring in place using lock paint.

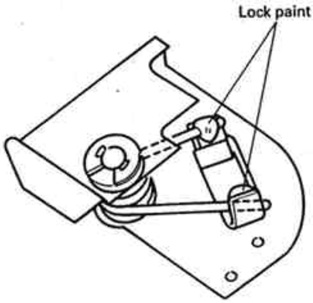


Figure 4-652

13. Delay in Engaging the Developing Assembly

If the cushion rubber on the front support plate of the developing assembly sticks to the developing assembly, the engagement of the developing assembly can be delayed, causing poor density along the leading edge of the copy; this is noted only on the first copy in continuous copying. Check the tape (FA9-2727) used to cover the cushion rubber for presence/peeling, and make sure that the tape is properly attached.

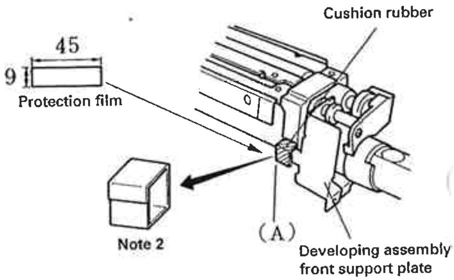


Figure 4-653

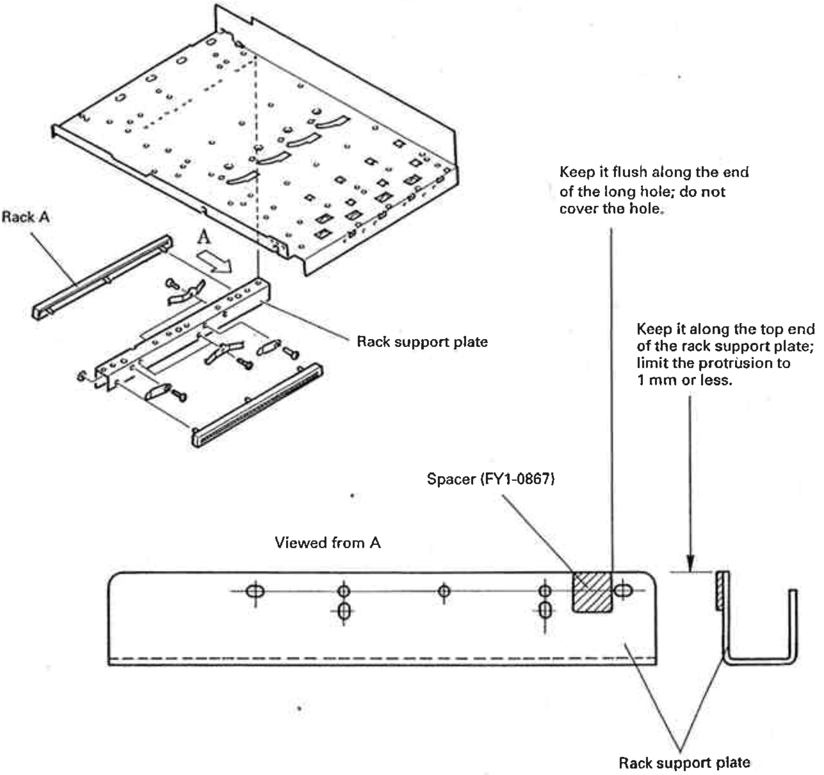
Note:
1. Make sure the surface (A) does not protrude over the cushion rubber.
2. Make sure that the overlapping tape will not be on the developing assembly side.

14. Positioning the Rack for the Developing Assembly Base

In some cases, the CLC300's rack may be displaced by 0.4 mm; if this is the case, attach a spacer (FY1-0867) to avoid abnormal noise and E021 that can occur in continuous copying.

Attach the spacer on the rack support plate to which rack A is mounted.

Applicable Machines
- LAY00686-LAY04293
- NAY00361-NAY03960
- PAY00026-PAY00290
- SAY00311-SAY02423
- TAY00321-TAY02615
- UAY00293-UAY02752
- QAY00154-QAY01213
- RAY00021-RAY00245



Keep it flush along the end of the long hole; do not cover the hole.

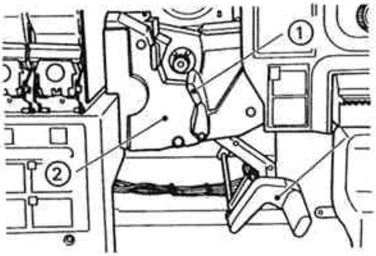
Keep it along the top end of the rack support plate; limit the protrusion to 1 mm or less.

Figure 4-654 Attaching the Spacer

B. Hopper Unit

1. Opening the Hopper Unit (CLC200)

1) Release the transfer drum lever and feeder unit lever.
2) Remove the transfer drum cover.



① Transfer drum lever
② Transfer drum cover
③ Feeder unit lever

Figure 4-655

3) Place copy paper on the feeder unit lever released as shown in Figure 4-656.

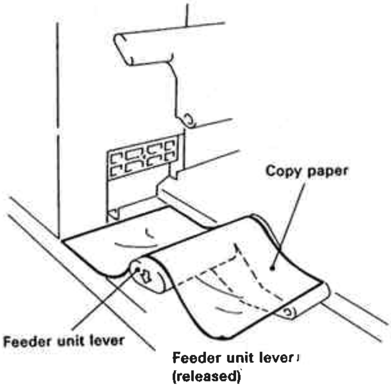
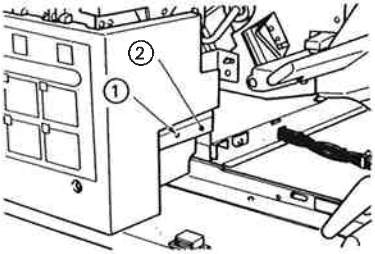

Copy paper
Feeder unit lever
Feeder unit lever
(released)

Figure 4-656

4) Remove the screw, and pull out the developing duct (upper) toward the right.



① Screw
② Developing duct (upper)

Figure 4-657

5) Cut copy paper to the size indicated in Figure 4-658 (A4/LTR).

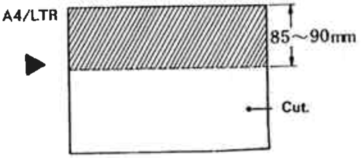

A4/LTR
85~90mm
Cut.

Figure 4-658

6) Place the copy paper over the space vacated by the developing duct (upper) pulled out in step 4); see Figure 4-659.

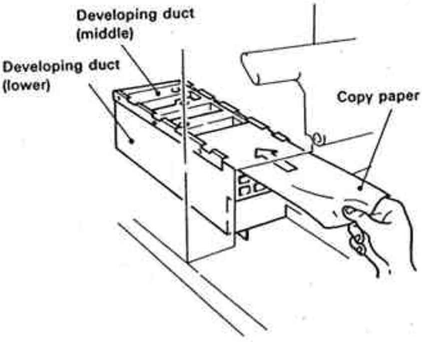
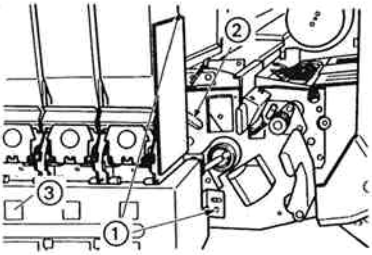

Developing duct
(middle)
Developing duct
(lower)
Copy paper

Figure 4-659

Note:
Without the above work, the toner would drip down on the developing assembly when the hopper is opened; make sure that the copy paper discussed in step 6) is placed fully to the end.

7) Remove the two screws, and open the hopper unit toward the front while shifting the gear release lever down.



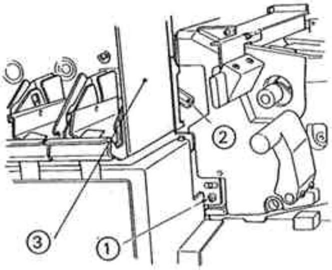
① Screws ③ Hopper unit
② Release lever

Figure 4-660

Note:
i. Check that the developing duct (upper) has been removed before opening the hopper unit.
ii. Place copy paper on the floor over which the hopper is moved about to prevent soiling.
iii. Remove all copy paper used before setting the hopper unit back on.

1a. Opening the Hopper Unit (CLC300/350)

1) Remove the screw, and open the hopper unit toward the front while shifting the gear release lever down.



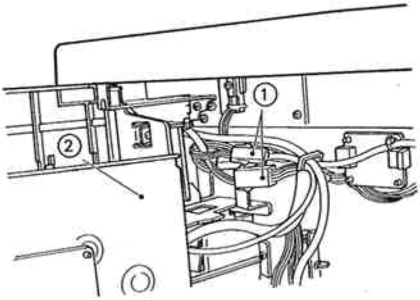
① Screws
② Release lever
③ Hopper unit

Figure 4-661

Note:
i. Place copy paper on the floor over which the hoper is moved about to prevent soiling.
ii. Remove all copy paper used before setting the hopper unit back on.

2. Removing the Hopper Unit

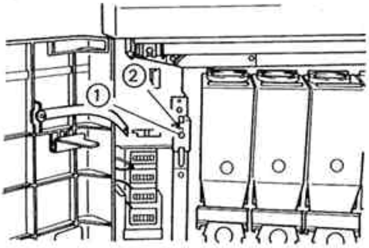
1) Remove the counter cover.
2) Open the hopper unit.
3) Disconnect the two connectors (6P, 12P).



① Connector
② Hopper unit

Figure 4-662

4) Loosen the screw on the hopper unit support shaft.



① Screw
② Hopper unit support shaft

Figure 4-663

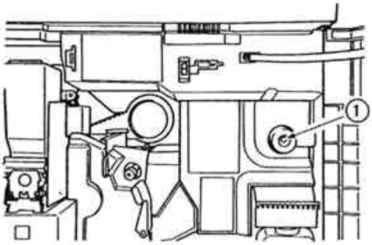
5) Lift the hopper unit support shaft to remove.

VII. FIXING SYSTEM

A. Fixing Assembly

1. Removing the Fixing Assembly

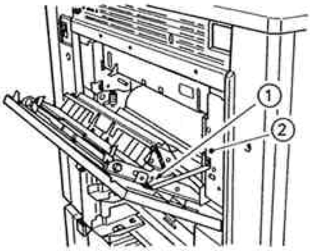
1) Remove the screw, and remove the fixing assembly knob.



① Fixing assembly knob

Figure 4-700

2) Remove the copy tray and manual feed tray.
3) Open the delivery cover, loosen the screw shown in Figure 4-701, and open the delivery cover fully.
4) Remove the connector cover (1 screw).

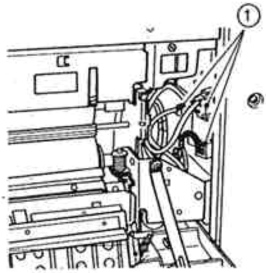


① Screw ② Connector cover

Figure 4-701

Note:
Make sure that the power plug is disconnected.

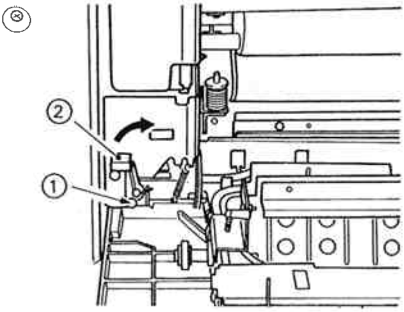
5) Disconnect the three connectors; four connectors if the offset tray is mounted.



① Connectors

Figure 4-702

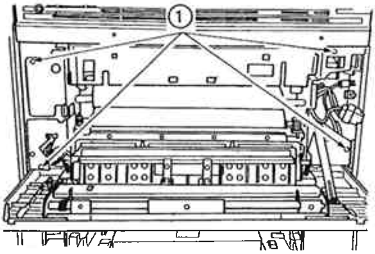
6) Remove the screw, and release the fixing assembly lock lever.



① Screw ② Lock lever

Figure 4-703

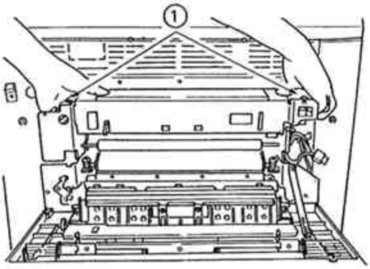
7) Remove the four fixing screws.



① Screws

Figure 4-704

8) Close the delivery cover, and remove the fixing assembly while holding the grips.



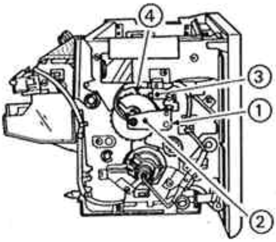
① Grips

Figure 4-705

Note:
i. Tighten the screw loosened previously (Figure 4-701) when mounting the fixing assembly.
ii. Take care not to spill the oil when removing the fixing assembly.
iii. Remove the fixing assembly and offset tray intact if the latter is attached to the former.
iv. Check that the belt detection lever is in contact with the cleaning belt.

2. Removing the Upper Heater and Upper Roller

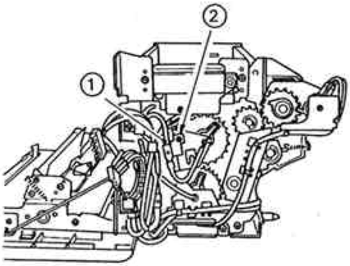
1) Remove the fixing assembly from the machine.
2) Remove the cleaning belt unit; see Figure 4-723.
3) Remove the screw, remove the upper heater terminal mount plate (front), and pull out the faston from the relay plate.



① Screw
② Heater terminal mount (front)
③ Relay plate
④ Faston

Figure 4-706 (front)

4) Pull out the upper heater faston from the rear relay plate.

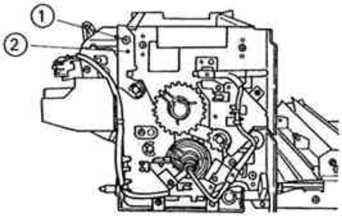


① Faston
② Relay plate

Figure 4-707 (rear)

5) Remove the upper heater from the front.

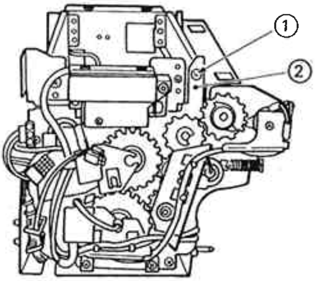
6) Remove the screw, and remove the front lock lever.



① Screw ② Lock lever

Figure 4-708 (front)

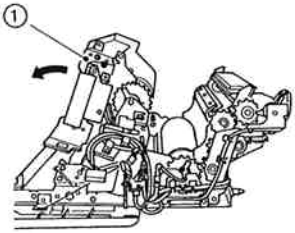
7) Remove the screw, and release the lock lever at the rear.



① Screw ② Lock lever

Figure 4-709 (rear)

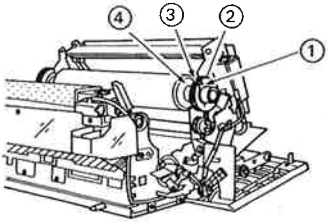
8) Open the delivery unit, and open the top of the fixing assembly with care.



① Top of fixing assembly

Figure 4-710

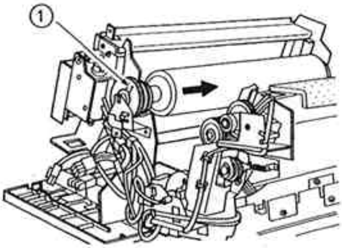
9) Remove the stop ring, and remove the gear, insulating bush, and ball bearing.



① Stop ring ③ Insulating bush
② Gear ④ Ball bearing

Figure 4-711 (front)

10) Remove the rear stop ring, and pull the upper roller toward the front to remove.



① Stop ring

Figure 4-712 (rear)

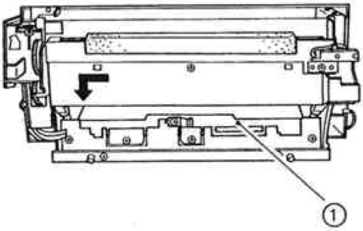
Note:
Take care not to drop the rear gear and bearing.

3. Points to Note in Mounting the Upper Heater and Upper Roller

i. Do not touch the upper heater.
ii. Mount the upper heater so that its voltage label is toward the front.
iii. Mount the upper heater while keeping the heater harness straight.
iv. Turn the upper roller by hand after mounting it, and check that it will not come into contact with parts around it.
v. Do not touch the upper roller; keep copy paper around it when handling it.
vi. The CLC200/300 and the CLC350 use different types of upper rollers; keep the following in mind:
CLC200/300: FA9-2151
CLC350: FB1-9435

4. Removing the Lower Heater and Lower Roller

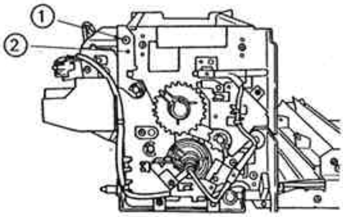
1) Remove the fixing assembly from the machine.
2) Remove the screw, and detach the paper guide.



① Paper guide

Figure 4-713

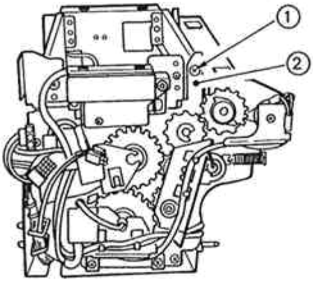
3) Remove the screw, and release the front lock lever.



① Screw ② Lock lever

Figure 4-714 (front)

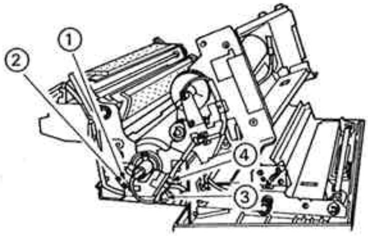
4) Remove the screw, and release the rear lock lever.



① Screw ② Lock lever

Figure 4-715 (rear)

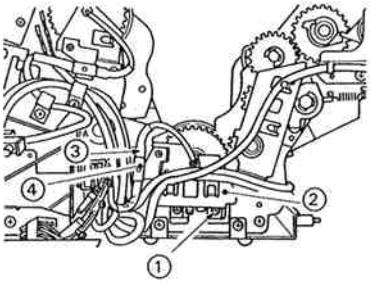
5) Remove the screw, remove the lower heater terminal mount plate (front), and pull out the faston from the relay plate.



① Screw
② Heater terminal mount (front)
③ Faston
④ Relay plate

Figure 4-716 (front)

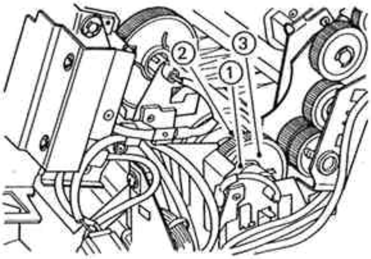
6) Remove the two screws, remove the heater terminal mount plate (rear), and pull out the faston from the relay plate.



① Screw
② Lower heater terminal mount plate (rear)
③ Faston
④ Relay plate

Figure 4-717 (rear)

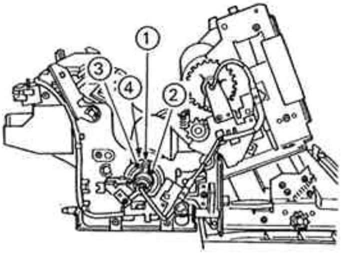
7) Remove the lower heater from the rear.
8) Remove the screw, and detach the thermistor.
9) Remove the stop ring and bearing gear.



① Stop ring
② Bearing
③ Gear

Figure 4-718 (rear)

10) Remove the stop ring, collar, insulating bush, and bearing.



① Stop ring
② Collar
③ Insulating bush
④ Bearing

Figure 4-719 (front)

11) Remove the lower roller from the fixing assembly.

5. Points to Note in Mounting the Lower Heater and Lower Roller

i. Do not touch the lower heater.
ii. Mount the lower heater so that its voltage label is toward the front.
iii. Mount the lower heater while keeping the heater harness straight.
iv. Turn the lower roller by hand after mounting it, and check that it will not come into contact with parts around it.
v. Do not touch the lower roller; keep copy paper around it when handling it.
vi. The CLC200/300 and the CLC350 use different types of lower rollers; keep the following in mind:
CLC200/300: FA5-8752
CLC350: FB1-9436

6. Adjusting the Nip (fixing assembly pressure adjusting nut)

- The nip width is correct if it is as shown in Table 4-700; otherwise, turn the adjusting nut.

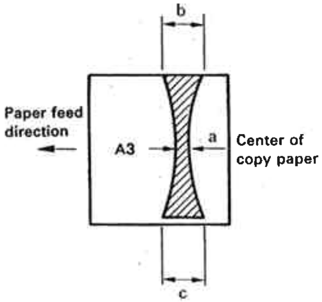


Figure 4-720

Note:
b and c are measured at points 10 to 15 mm away from the end of paper.

Ref.	Measurement*
a	$6^{+1.0}_{-0.5}$ mm
b – c	0.5 mm or less
b – a c – a	1 mm or less

Table 4-700

*Taken when both upper and lower rollers are sufficiently heated.

- How to Measure the Nip

If the rollers are not warm, allow 15 minutes after the standby period is over and make 20 copies before taking measurements.

1) Enter the service mode.
2) In the case of the CLC200, select 'FUNCTION', and select 'F-MISC'.
   In the case of the CLC300/350, select 'FUNCTION', and select 'F-MISCp'.
3) Press the ▷ key to select 'NIP-CHK=1'.
4) Press the COPY START key to execute the command; the operation stops automatically.

7. Positioning the Thermistor

Note:
The position of the thermistor does not have to be adjusted; however, if contact is not uniform, check if the thermistor spring has not deformed. Clean the thermistor if it is soiled with toner.

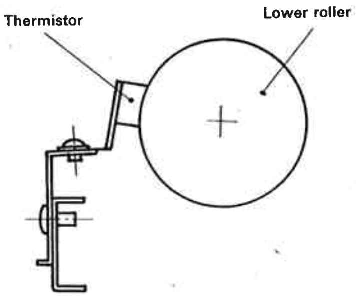


Figure 4-721

8. Positioning the Thermal Fuse

The position of the thermal fuse does not have to be adjusted.

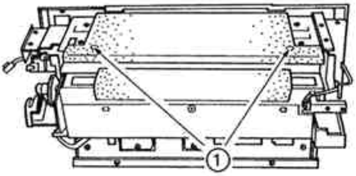
Note:
Use a thermal fuse which blows at 150°C as a replacement.

Note:
Screw the thermal fuse always with a washer in between.

B. Fixing Assembly Cleaner Unit

1. Removing the Cleaning Belt

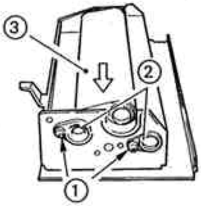
1) Remove the fixing assembly from the machine.
2) Remove the two screws.
3) Remove the cleaning belt.



① Screws

Figure 4-722

4) Remove the two screws and two bushings, and pull out the cleaning belt in the direction of the arrow shown in Figure 4-723.



① Screws
② Bushings
③ Cleaning belt

Figure 4-723

2. Points to Note in Attaching the Cleaning Belt

i. Attach the belt so that it is over the cleaning belt detection lever as shown in Figure 4-724.

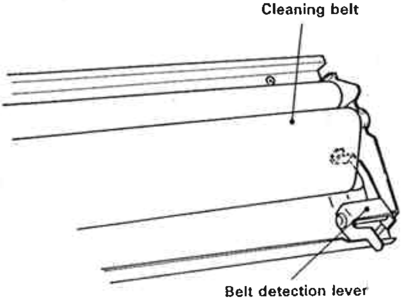
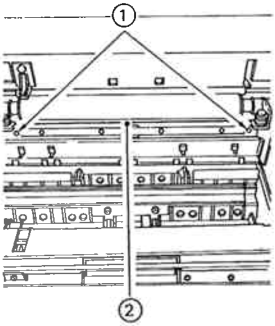


Figure 4-724

ii. Check that the belt is attached correctly and it is free of slacks and wrinkles.
iii. Clear the counter reading of the belt in the service mode after replacement.

3. Cleaning the Oil Scraping Blade (lower fixing roller)

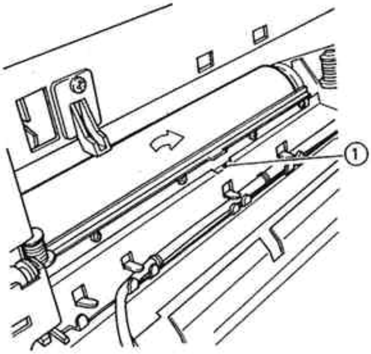
1) Open the delivery unit.
2) Remove the two screws shown.



① Screws
② Oil scraping blade

Figure 4-725

3) Lift the mount for the oil scraping blade.
- Do not hold the blade directly; pick the blade retainer using a wrench.



① Oil scraping blade mount

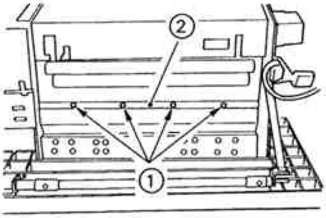
Figure 4-726

4) Dry wipe the oil scraping blade.

> **Note:**
> When cleaning the CLC200's oil blade, the above steps do not apply. Detach it first before cleaning.

4. Removing the Lower Fixing Roller Oil Scraping Blade

1) Open the delivery unit of the fixing assembly fully; see Figure 4-701.
2) Remove the four screws.



① Screws ② Oil scraping blade

Figure 4-727

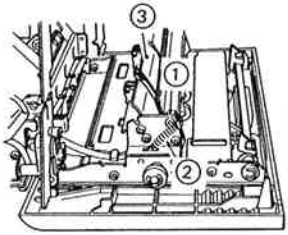
3) Remove the oil scraping blade.

> **Note:**
> Screw the oil scraping blade in place so that it is uniformly in contact with the entire length of the lower roller.

C. Delivery Unit

1. Removing the Separation Claw

1) Open the delivery unit.
2) Remove the two screws (stepped) and two springs, loosen the two screws, and remove the feeder guide plate.



① Stepped screw ③ Feeder guide palte
② Springs

Figure 4-728

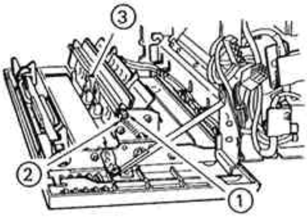
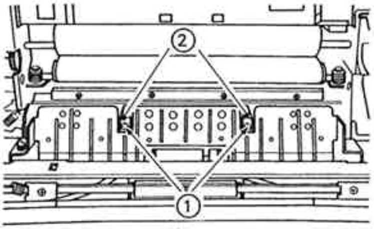


Figure 4-729

3) Remove the screw, and remove the separation claw.



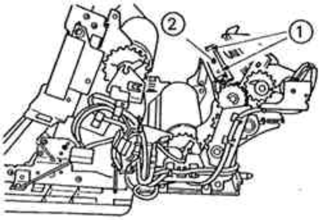
① Screws ② Separation claws

Figure 4-730

D. Oil Application Unit

1. Removing the Oil Application Unit

1) Remove the fixing assembly from the machine.
2) Remove the cleaning belt unit.
3) Open the top of the fixing assembly; see Figure 4-710.
4) Remove the two screws, and remove the oil application unit.



① Screws ② Oil application unit

Figure 4-731

2. Re-Shaping the Oil Application Felt

If a fixing oil streak or unevenness occurs on copies, take the following action.

Note:
If an oil streak or unevenness is conspicuous on a black area of a copy, the problem is the upper fixing roller or the oil application felt. If an oil streak or unevenness is conspicuous on a white area of a copy, the problem is the lower fixing roller or the lower roller blade.

1) Remove the oil application felt, and clean the application surface with lint-free paper moistened with oil.

- Correct any wrinkles and deformation on the application surface.

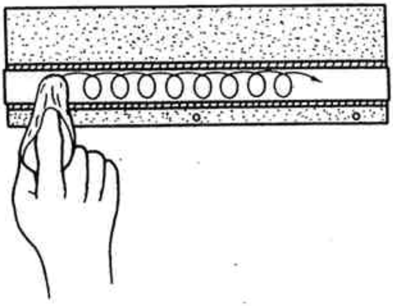


Figure 4-732

2) Install the oil application felt on the mounting plate.

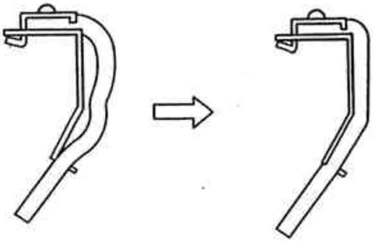


Figure 4-733

VIII. OPTIONS

A. Removing the Offset Tray

1) Remove the copy tray and manual feed tray from the machine.
2) Open the delivery unit, loosen the screw on the hold tape, and tighten the screw with the delivery unit fully open.

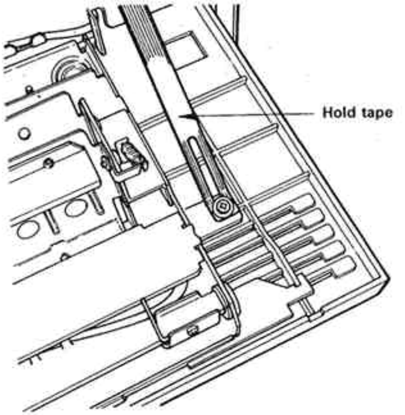


Figure 4-800

3) Remove the connector cover found on the right of the fixing assembly (1 screw).

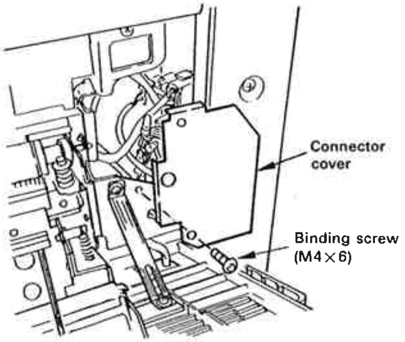

Connector cover
Binding screw (M4×6)

Figure 4-801

Note:
Make sure that the power plug is disconnected.

4) Remove the connector (6P) from the Offset Tray, remove the harness from the wire saddle behind the steel plate.

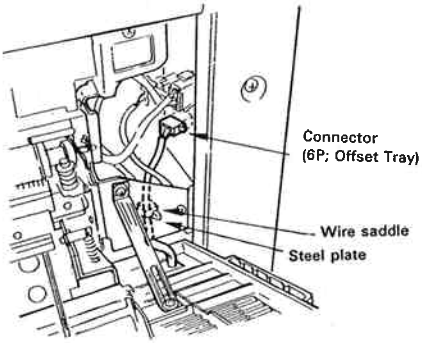

Connector (6P; Offset Tray)
Wire saddle
Steel plate

Figure 4-802

5) Close the delivery unit, remove the three screws, and remove the Offset Tray.

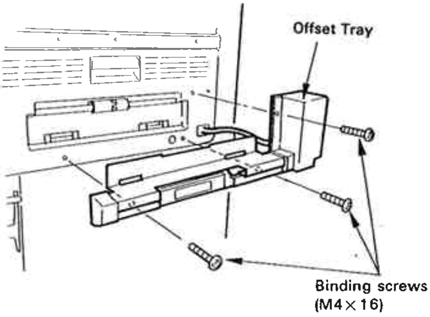

Offset Tray
Binding screws (M4×16)

Figure 4-803

B. Removing the Image Editing Unit

1) Remove the rear cover and left cover from the machine.
2) Disconnect the two connectors, and remove the cable mount plate (3 screws).

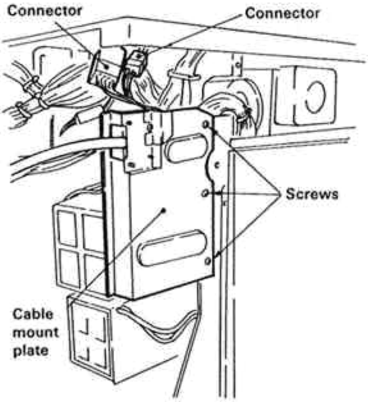

Connector
Connector
Screws
Cable mount plate

Figure 4-804

3) Remove the Image Editing Unit.

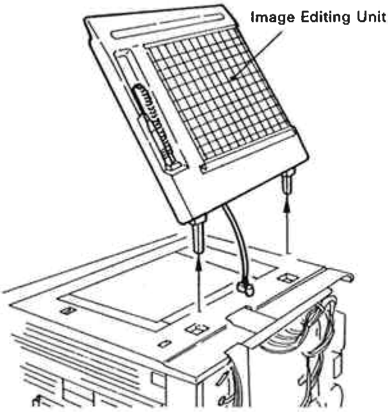


Image Editing Unit

Figure 4-805

C. Removing the Paper Deck

1) Remove the copy tray, manual feed tray, and cassettes from the machine.
2) Remove the two screws found on the right and left sides of the Paper Deck, and detach the Paper Deck while holding its base plate.

Note:
Do not hold the Paper Deck by its upper stay.

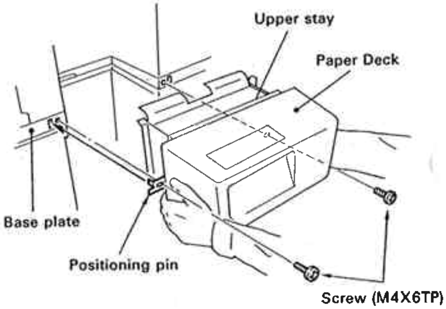

Upper stay
Paper Deck
Base plate
Positioning pin
Screw (M4X6TP)

Figure 4-806

- Points to Note
- Do not hold the Paper Deck by its upper stay.
- Pay attention to the pick-up roller when mounting the Paper Deck.

CHAPTER 5

INSTALLATION

Each machine is carefully adjusted and strictly inspected before it leaves the factory and, therefore, proper installation is very important in maintaining its out-of-factory performance. Make sure that all the conditions discussed in this chapter are satisfied before installation, and carry out all necessary inspections after installation.

I. LOCATION 5-1
II. INSTALLATION (CLC200) 5-2
IIa. INSTALLATION (CLC300/350)... 5-15
III. RELOCATION 5-30
IV. MOUNTING THE DOCUMENT TRAY 5-31
V. SETTING THE CASSETTE SIZE 5-32
VI. MOUNTING THE SOCKET FOR CCII/CCIII 5-34
VII. MOUNTING CCV 5-36
VIII. MOUNTING THE IC CARD UNIT 5-38

I. LOCATION

The location of the machine should be chosen based on the following considerations. If possible, make a visit to the user for a study of the site before delivery of the machine.

i. The machine should be given an exclusive power outlet with the specified ratings; an outlet shared with a refrigerator or other appliances is subject to voltage fluctuations.

ii. The ambient temperature should be as shown in Figure 5-1. Avoid locations near water faucets, humidifiers, water boilers, and refrigerators.

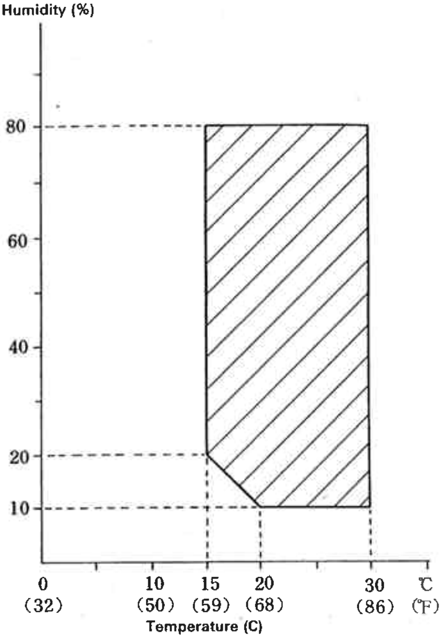


Figure 5-1 Environment

iii. Avoid locations near open fire or subject to dust or ammonia fumes and direct rays of the sun. Provide curtains over the windows if necessary.

iv. Choose a well-ventilated location.

Note:
The machine generates a limited amount of ozone while in use; although the amount is not harmful to the health of those around the machine, ventilate the room if its odor is found to be offensive while at work.

v. Make sure all feet of the machine will be in contact with the floor.

vi. Allow at least 10 cm from any wall to provide access.

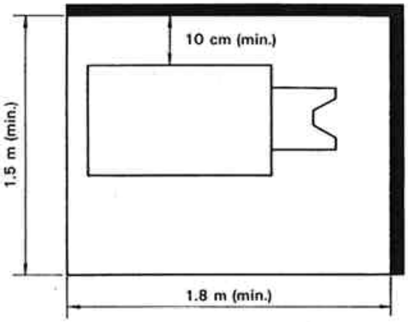
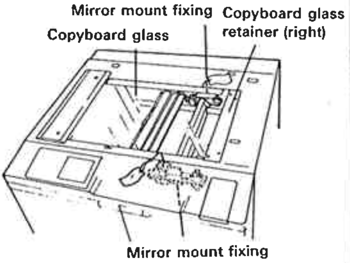
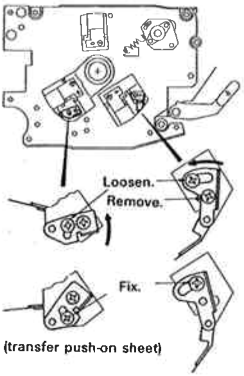
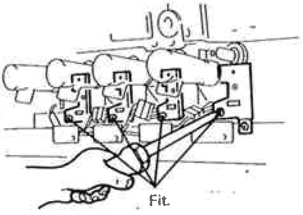
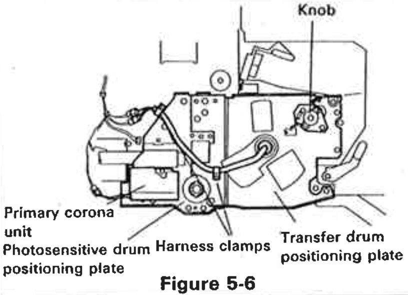


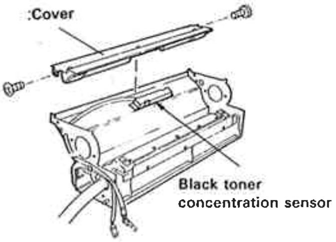
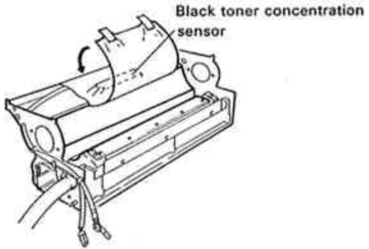
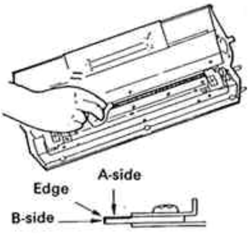
Figure 5-2

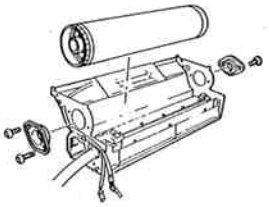
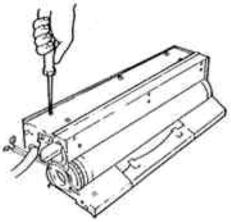
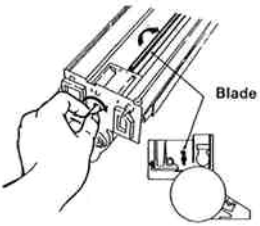
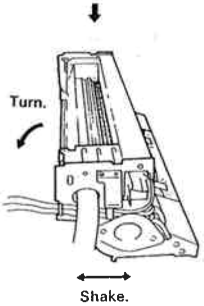
II. INSTALLATION (CLC200)

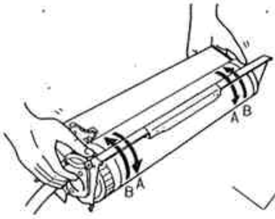
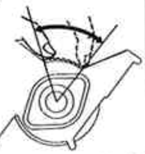
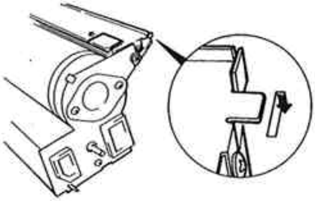
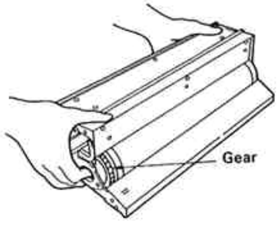
When a piece of metal is moved from a cold place to a warm place, droplets of water form on its surface. This phenomenon is known as condensation and affects the performance of machines.
The simplest way to eliminate condensation from the machine, any machines for that matter, is to leave it alone until it warms to room temperature (at least one hour).

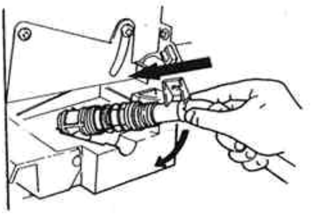
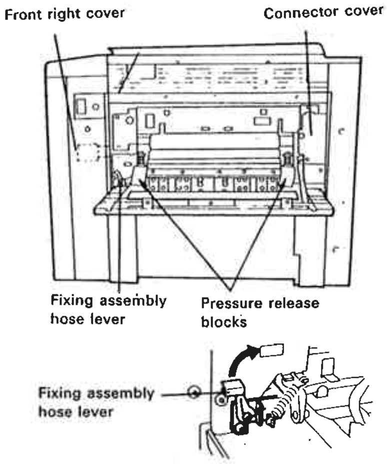
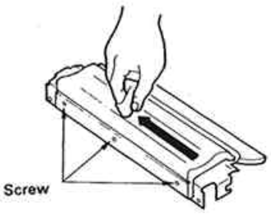
Step	Work	Remarks
1	Open the shipping box.	
2	Lift the machine off the skid. Place it on the pedestal if available.	The machine weighs 170 kg, requiring four persons to lift.
3	Push in the grip bars.	
4	Open the accessories box, and take out its contents. Hold the M, C, Y, and Bk starter developers, and shake them lightly; thereafter, detach the funnel, peel the seal and attach the funnel back on. Store it inside the pedestal or in a dust-free location. The environmental sensor checks the humidity of the room, and uses this information to adjust some of the copier's operations. Exposing the starter developers to room conditions, at this time, will allow them to adapt to the working environment.	Check that the following are available: • Photosensitive drum • Photosensitive drum unit (excluding the photosensitive drum, but including the pre-cleaning corona unit); 2 screws • Drum bushing (2 pcs.); 4 screws • Copy tray • Manual feed tray, Size label • Security key, Door switch lever • Silicone oil bottle • Drum cleaner lubricant • Hopper cap (4 pcs.) • Oil seal extraction tool (for oil seal replacement; every 20,000 copies) • Document tray; 2 stepped screws • OPERATOR'S MANUAL • Developing assembly duct (lower); 1 screw • Developing assembly duct (middle); 1 screw • Developing assembly duct (upper); 1 screw
5	Peel the shipping tape from the machine.	
6	Open the front door, and remove the shipping tape and styro foam blocks; i.e., from levers, etc.	Remove the transparent cover from the top of the hopper immediately before setting the toner bottle. Set the large-capacity waste toner case if the pedestal is expected to be in use.

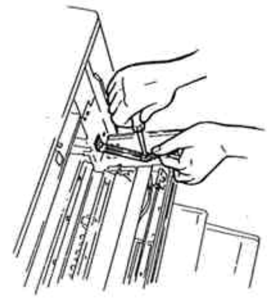
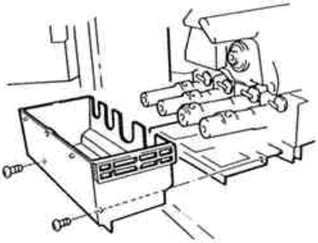
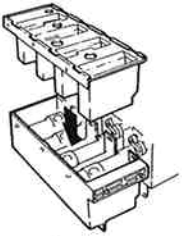
Step	Work	Remarks
7	Remove the copyboard glass retainer (right; 2 screws), and remove the copyboard glass.	 Mirror mount fixing Copyboard glass retainer (right) Copyboard glass Mirror mount fixing Figure 5-3
8	Remove the two mirror mount fixings (1 screws each).	
9	Place the copyboard glass butted against the left end, and mount the copyboard retainer (right). • Do not move the glass retainer found below the copyboard glass retainer (right). • Take care so that the glass will not override the stoppers at the front and rear.	
10	Remove the transfer drum cover (2 release levers; 2 screws), and open the hopper unit (release lever; 2 screws).	 Loosen. Remove. Fix. (transfer push-on sheet) Figure 5-4 (attraction push-on sheet)
11	Remove the fixing screw (M3 × 14) from the attraction push-on sheet. Loosen the screw (M3 × 4) shown in Figure 5-4, move the push-on sheet to the point of engagement, and fix it by tightening the screw.	
12	Loosen the fixing screw on the transfer push-on sheet, move the push-on sheet to the point of engagement, and fix it by tightening the screw. • No screw is to be removed from the transfer push-on sheet.	
13	Remove the four fixing plates from the developing assembly and developing assembly shift base; 5 screws in total. The three fixing plates on the left may be used as a door switch actuator; store them.	 Figure 5-5
14	Fit the four screws shown in Figure 5-5 which hold the developing assembly in place; of those removed in step 13.	
15	Remove the primary corona unit (1 screw; 1 connector).	 Knob Primary corona unit Photosensitive drum positioning plate Harness clamps Transfer drum positioning plate Figure 5-6
16	Disconnect the three connectors of the harness coming from the transfer drum, and remove the two screws which hold the harness in place.	
17	Remove the transfer drum positioning plate while lifting the knob (5 screws).	
18	Remove the photosensitive drum positioning plate (2 screws). • Take care not to drop the bearing from the center of the positioning plate.	

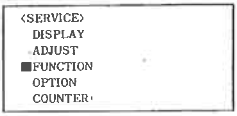
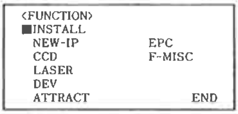
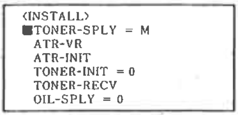
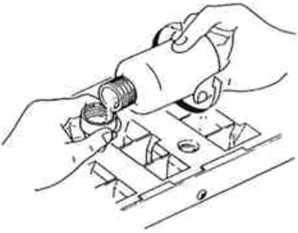
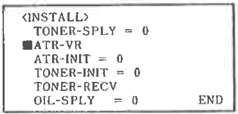
Step	Work	Remarks
19	Remove the drum stopper from the photosensitive drum bushing (1 screw).	
20	Remove the dummy drum.	Keep the dummy drum level while removing it.
21	Take out the pre-cleaning corona unit from the drum unit.	Take care; the pre-cleaning corona unit is fragile, and its corona wire is exposed.
22	Remove the cover shown in Figure 5-7 (2 screws).	 Figure 5-7
23	Wipe the window of the black toner concentration sensor using lint-free paper with a single stroke.	 Figure 5-8
24	Put two sheets of copy paper around the black toner concentration sensor, and tape them; make sure the paper is tight.	
25	Shake the drum cleaner lubricant bottle (packaged) well. Apply the drum cleaner lubricant evenly over the blade of the photosensitive drum cleaner unit. • Take care; uneven application can lead to vertical white lines on copies. • Apply the lubricant over the A- and B-sides as well as the edge of the blade. • Lightly tap on it; do not rub it, as doing so could chip the edge.	 Figure 5-9

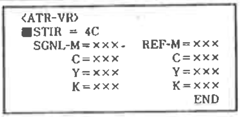
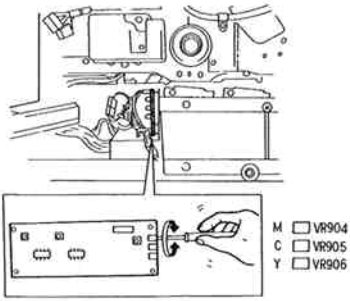
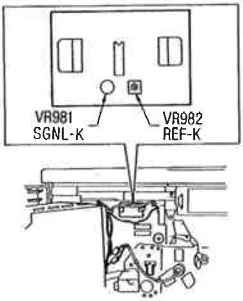
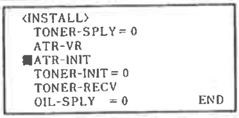
Step	Work	Remarks
26	Remove the light-blocking sheet, place the photosensitive drum on the drum unit, and fix it in place using two bushings (2 screws; accessory). • Make sure that the gear of the photosensitive drum is toward the waste toner hose.	 **Figure 5-10**
27	Turn the drum unit upside down, and place it on a sheet of paper on a flat surface. This is to prevent damaging the photosensitive drum. Remove the cover from the photosensitive drum cleaning unit (5 screws). Hold the drum unit so as not to tip it. This will prevent possible damage to the drum.	 **Figure 5-11**
28	Check the position of the blade inside the drum cleaning unit; if not vertical, turn the drive shaft found at the rear of the drum cleaning unit to correct it.	 **Figure 5-12**
29	Shake the drum cleaner lubricant bottle (packaged), and remove the cap. Pour a capful (about 5 g) of the lubricant evenly over the drum surface starting with the photosensitive drum cleaning unit toward the rear. • Take care; uneven application can lead to vertical white lines on copies. • Keep the remaining lubricant in the pedestal for use at time of drum replacement.	 **Figure 5-13**
30	Mount the cover on the photosensitive drum; use the 5 screws removed in step 27.	
31	Shake it lightly as shown in Figure 5-13.	
32	Turn it over in the direction of the arrow; see Figure 5-13.	

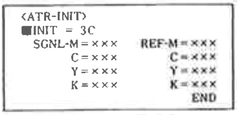
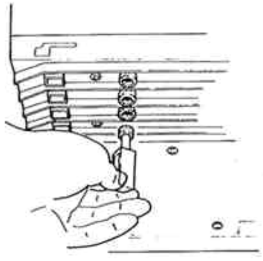
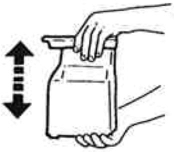
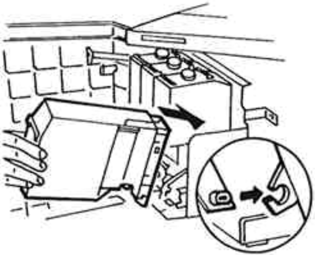
Step	Work	Remarks
33	Put fingers at both ends of the drum, and give it a half turn in the direction of A; see Figure 5-14. Push the sections shown in Figure 5-15 with fingers; four pushes should complete a half turn (approx.).	When rotating the drum in the direction of (A), make sure sufficient lubricant is applied to the drum. This will help to better lubricate the cleaning blade. It is critical to rotate in the (A) direction first because this direction of rotation applies lubricant to the drum which then lubricates the cleaning blade when the drum is rotated in direction (B). Rotate the drum carefully during this procedure so as not to damage it.
34	Give it a half turn in the direction of B.	
35	Repeat steps 33 and 34 five times; further, give it a 1/2 turn in the direction of B to make sure that the lubricant is fully returned to the cleaning assembly.	
36	Remove the copy paper placed in step 24. • Take care so that the tape will not come into contact with the photosensitive drum.	 Figure 5-14  Figure 5 -15
37	Mount the cover removed in step 22 (2 screws) while pushing it in the direction of the arrow.	 Figure 5-16
38	Move the developing assembly shift base to its home position, and insert the photosensitive drum into the drum bushing along the rail. • It is in its home position if the space between the M and C developing assemblies is found directly below the photosensitive drum. • The drum unit will stop when inserted about 5 cm because a guide pin on the drum shaft must fit through the drum for proper positioning. Keep the drum unit level, and push it slowly while turning the gear of the drum counterclockwise. Continue until drum unit slides in smoothly.	 Figure 5-17
39	Connect the two connectors coming from the drum unit.	

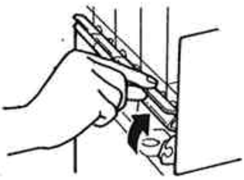
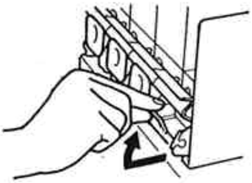
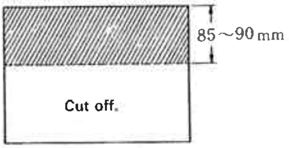
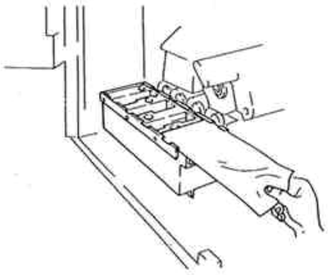
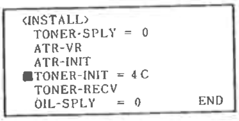
Step	Work	Remarks
40	Mount the stopper removed in step 19 inside the drum bushing.	 Figure 5-18
41	Push the waste toner hose into the mount opening, and fix it in place using a screw.	
42	Mount the photosensitive drum positioning plate (2 screws).	
43	Lead the harness through the center of the transfer drum positioning plate, and mount the positioning plate (5 screws).	
44	Connect the harness coming from the transfer drum (3 connectors; 2 screws).	
45	Set the primary corona unit, and connect the connector (1 screw).	
46	Set the pre-cleaning corona unit (1 screw; accessory).	
47	Position the transfer drum lever.	Check that the front right door closes and opens properly.
48	Open the delivery unit, and pull out the two pressure release blocks.	 Front right cover Connector cover Fixing assembly hose lever Pressure release blocks Fixing assembly hose lever Figure 5-19
49	Remove the fixing assembly. 1) Lower the manual feed lever, and remove the front right cover (1 screw). 2) Remove the connector cover (1 screw), and remove the three connectors. 3) Remove the screw, and release the fixing assembly hose lever; the oil hose will move up. 4) Remove the four fixing screws. 5) Pull out the fixing assembly, and remove the fixing assembly by holding its grips.	
50	Release the lock levers at the front and rear of the fixing assembly (1 screw each), and open the top of the fixing assembly.	
51	Check that the oil application felt is moist with silicone oil; go to steps 52, 53, and 54 if it is dry.	How to Check Feel the point at which the oil application felt and the upper fixing roller come into contact with a finger; if moist, keep as is.  Figure 5-20
52	Remove the oil application felt together with its mount (2 screws).	
53	Place a newspaper or waste paper. Drip oil onto lint-free paper by tilting the oil bottle. Rub the oil-soaked lint-free paper over the section of the felt that comes into contact with the upper fixing roller; remove the three screws, and put oil on the back side of the felt also.	

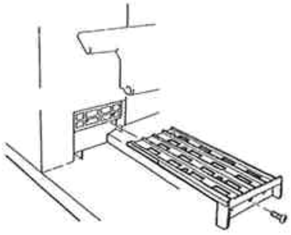
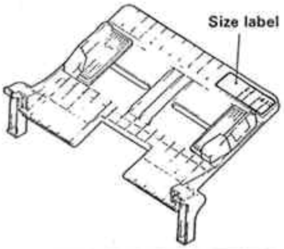
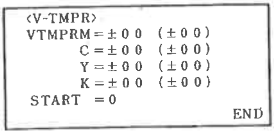
Step	Work	Remarks
54	Fit the three screws back in, and mount the oil application felt (2 screws).	Take care so that the silicone oil will not drip outside the oil case, i.e., inlet guide, etc.
55	Close the top of the fixing assembly, and fix it by the lock lever (2 screws).	Check that the belt detection lever is in contact with the cleaning belt.
56	Mount the fixing assembly (4 screws, 3 connectors).	 Figure 5-21
57	Lower the fixing assembly hose lever, and tighten the screw; the oil hose will move down.	
58	Mount the connector cover (1 screw) and front right cover (1 screw).	
59	Loosen the screw that holds the tape at the rear of the delivery unit, and tighten it as shown in Figure 5-21 while lifting the delivery unit.	
60	Set the oil bottle.	
61	Move the developing assembly to the right, check that the three connectors on the front of the developing assembly are properly connected, and mount the developing assembly duct (lower; 2 screws). At the time, check the position of the color toner concentration adjustment PCB to facilitate work after step 76; see Figure 5-30.	 Figure 5-22
62	Engage the six protrusions, and mount the developing assembly duct (middle; 1 screw).	 Figure 5-23

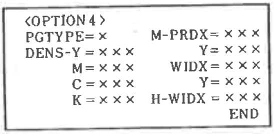
Step	Work	Remarks
63	Connect the power plug into the wall outlet, and turn the machine ON.	
64	Insert the door switch actuator into the right and left door switches and the laser shutter; 3 points.	If 'ADD OIL' comes ON during the following steps, turn the machine OFF and ON.
65	Insert the security key.	
66	Press the *, ◁, ▷, and * keys on the control panel in sequence to enter the service mode.	Press the ◁ and ▷ keys at the same time.
67	Press the ▽ key to move the cursor to 'FUNCTION', and press the OK key.	 ‹SERVICE› DISPLAY ADJUST ■FUNCTION OPTION COUNTER **Figure 5-24**
68	Press the OK key to select 'INSTALL'.	 ‹FUNCTION› ■INSTALL NEW-IP EPC CCD F-MISC LASER DEV ATTRACT END **Figure 5-25**
69	Press the ▷ key to select 'TONER-SPLY=M', and press the OK key. • About 15 sec later, the developing assembly starts to move in response; thereafter, the screw inside the M developing assembly will start to rotate. • Hold the ▷ key down to move from 0 to M, C, Y, and K in sequence.	 ‹INSTALL› ■TONER-SPLY = M ATR-VR ATR-INIT TONER-INIT = 0 TONER-RECV OIL-SPLY = 0 **Figure 5-26**
70	Pour the starter developer into the developing assembly whose screw is rotating. • Take care; the developing assemblies hold toner of the following colors; from right to left. M: magenta C: cyan Y: yellow Bk:black • Tilt the bottle while turning it slowly. Note: Take care; the developing assembly will automatically return to its home position in about 5 min.	 **Figure 5-27**
71	Press the C/⊘ key to stop the operation.	
72	Perform steps 69, 70 and 71 for C, Y, and Bk toners.	
73	Press the ▽ key to move the cursor to 'ATR-VR', and press the OK key.	 ‹INSTALL› TONER-SPLY = 0 ■ATR-VR ATR-INIT = 0 TONER-INIT = 0 TONER-RECV OIL-SPLY = 0 END **Figure 5-29**

Step	Work	Remarks
74	Press the ▷ key six times (or ◁ key once) to select 'STIR=4C', and press the OK key. • The toner inside each developing assembly will be mixed in sequence from M to C, Y, and Bk, and the operation will stop. • Nos. 105, 106, and 107 may be performed during the wait time.	 ‹ATR-VR› ■STIR = 4C SGNL-M=xxx- REF-M=xxx C=xxx C=xxx Y=xxx Y=xxx K=xxx K=xxx END **Figure 5-29**
75	Press the ▽ key to move the cursor to 'SGNL-M', and press the OK key; the developing assembly should shift in response. • A buzzer without a break is sounded when the value of 'SGNL-M' falls to 204±3. Turn the topmost VR; turn the VR clockwise if no buzzer is sounded, and turn it counterclockwise if a buzzer is sounded at short intervals. • To adjust the VR, wait at least 15 seconds after the developing assembly has moved.	 **Figure 5-30**
76	Check that the value is 204±3 on the display, and press the C/⊗ key.	
77	Press the ▽ key to move the cursor to 'SGNL-C', and press the OK key. Make adjustments as in steps 75 and 76.	Turn the middle VR.
78	Press the ▽ key to move the cursor to 'SGNL-Y', and press the OK key. Make adjustments as in steps 75 and 76.	Turn the bottom most VR.
79	Press the ▽ key to move the cursor to 'SGNL-K', and press the OK key. Adjust VR981 as in steps 75 and 76.	 **Figure 5-31**
80	Press the ▽ key to move the cursor to 'REF-K', and press the OK key. Make sure that the REF-K value is 204±3 and press the C/⊗ key. If the value is not correct, adjust VR982 according to steps 75 and 76.	
81	Press the RESET key, pull out the door switch actuator, and close the hopper (1 lever). • The two screws may be left out.	
82	Close the front door.	
83	Enter the service mode once again (*, ◁; ▷, *), and select 'FUNCTION' and then 'INSTALL' in succession.	 ‹INSTALL› TONER-SPLY = 0 ATR-VR ■ATR-INIT TONER-INIT = 0 TONER-RECV OIL-SPLY = 0 END **Figure 5-32**
84	Press the ▽ key to move the cursor to 'ATR-INIT', and press the OK key.	

Step	Work	Remarks
85	Press the ▷ key to select 'INIT=3C', and press the OK key. • The machine reads the value of SGNL-M, REF-M, SGNL-C, REF-C, SGNL-Y and REF-Y and stops automatically. • If 'E020' comes ON, turn the machine OFF and ON, and start with step 83.	 ‹ATR-INIT› ■INIT = 3C SGNL-M=××× REF-M=××× C=××× C=××× Y=××× Y=××× K=××× K=××× END Figure 5-33
86	Press the ▷ key to select 'INIT=K', and press the OK key. • 'INIT=K2' and 'INIT=K3' may be skipped.	The machine reads the values of SGNL-K and REF-K and stops automatically.
87	Take notes of the eight values.	Record the values on the Service Mode Label behind the left cover after installation.
88	Open the front door and hopper.	Place waste paper under the hopper.
89	Fit the stoppers into the four holes found in the bottom of the hopper. • Make sure that the stoppers are all the way in.	 Figure 5-34
90	Shake the M toner bottle up and down gently; about five up/down motions.	 Figure 5-35
91	Remove the transparent cover from the top of the hopper, fit the M toner bottle into the cut-out of the bottle fixing lever, and push it in while turning it. • Set the bottles in order, i.e., M, C, Y, and Bk from right to left.	 Figure 5-36

Step	Work	Remarks
92	Shift the bottle fixing lever up.	 Figure 5-37
93	Set the C, Y, and Bk toner bottles as in steps 90, 91, and 92.	
94	PUll out the shutter levers of the M, C, Y, and Bk toner bottles toward the front, and shift them up. • Keep them as they are for three minutes or longer. • Nos. 96 and 97 may be performed during the wait time.	 Figure 5-38
95	Hold copy paper under the hopper, and pull out the stoppers from the hopper; M, C, Y, and Bk.	
96	Cut A4/LTR copy paper to the size shown in Figure 5-38.	 Figure 5-39
97	Slide the copy paper over the top of the developing assembly duct (middle).	 Figure 5-40
98	Close the hopper, and fix it in place (lever; 2 screws).	
99	Mount the transfer drum cover (2 screws), and close the front door.	
100	Enter the service mode again, and select FUNCTION and then INSTALL.	 <INSTALL> TONER-SPLY = 0 ATR-VR ATR-INIT ■TONER-INIT = 4C TONER-RECV OIL-SPLY = 0 END
101	Press the ∇ key to position the cursor on TOEN-INIT.	
102	Press the ▷ key to select TONER-INIT=4C, and then press the OK key.	
103	Press the RESET key.	• Toner is fed to the hopper outlet and stopped automatically. Figure 5-41

Step	Work	Remarks
104	Remove the copy paper; insert the developing assembly duct (upper) into the right side of the developing assembly duct (middle), and fix it in place (1 screw).	 Figure 5-42
105	Put paper into the cassette, and set the cassette.	
106	Attach the size label on the manual feed tray.	
107	Set the document tray, manual feed tray, and copy tray.	
108	Set the Test Sheet on the copyboard, and check the copy operation. • Check that the specified number of copies is made. • Check that no abnormal noise is heard. • Check the copy quality.	Check the copy quality; if not normal, make adjustments as shown in BASIC IMAGE ADJUSTMENT PROCEDURE.
109	Perform the following to stir the toner if the copy density is too high or the gray balance is not correct. 1) Enter the service mode, and select 'ATR-VR'. 2) select 'STIR=4C', and press the OK key; repeat this twice.	
110	Perform the following to adjust the contrast (part of installation work) if the problem is not corrected by 109: 1) Select 'V-TMPR' of 'ADJUST'. 2) Decrease the value of 'T-TMPR' if the density is too high; increase the value of 'V-TMPR' if the density is too low. 3) select 'START=1', and press the OK key.	 ‹V-TMPR› VTMPRM=±00 (±00) C=±00 (±00) Y=±00 (±00) K=±00 (±00) START =0 END Figure 5-44 If the value of 'VTMPRK' has been changed, activate 'INIT=K' under <ATR-INIT> once again.

Step	Work	Remarks
111	Select 'Bk mono, A3/LDG', and enter the service mode.	 〈OPTION 4〉 PGTYPE=× M-PRDX=××× DENS-Y=××× Y=××× M=××× WIDX=××× C=××× Y=××× K=××× H-WIDX=××× END **Figure 5-45**
112	Select'OPTION', and press the ▽ key to bring up screen 'OPTION4'.	
113	Press the ▷ key to select 'PGTYPE=5'.	
114	Press the ▽ key to select 'DENS-K', and press the ▷ key to select 'DENS-K=160'.	
115	Press the COPY START key.	The test print-out will be in Bk half tone; keep it stored (in the pedestal, etc.).
116	Press the key to select 'PGTYPE', and press the key to select 'PGTYPE=0'.	
117	Set the users options mode to suit the needs of the user.	
118	Adjust the feet of the machine using the level gauge (CK-0059); the machine needs to be kept level to keep its liquid consumables (oil, in particular) level.	If the floor is not sturdy or not level, use a sturdy plate (steel) larger than the bottom size of the machine.
119	Fill out the Service Sheet.	

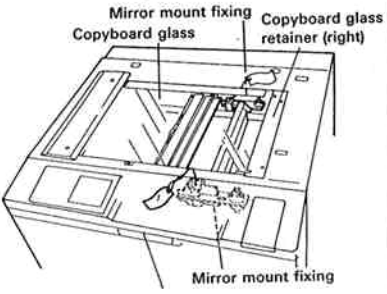
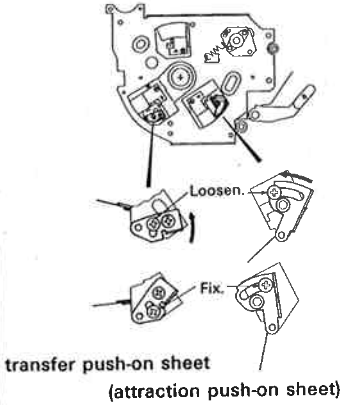
IIa. INSTALLATION (CLC300/350)

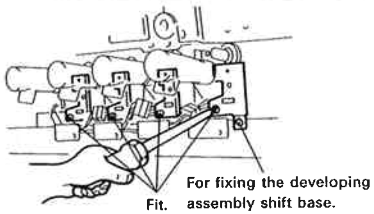
When a piece of metal is moved from a cold place to a warm place, droplets of water form on its surface. This phenomenon is known as condensation and affects the performance of machines.
The simplest way to eliminate condensation from the machine, any machines for that matter, is to leave it alone until it warms to room temperature (at least one hour).

A. Unpacking

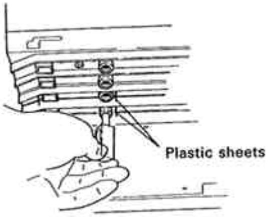
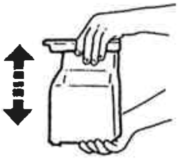
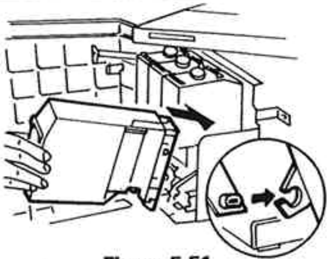
Step	Work	Remarks
1	Open the shipping box.	
2	Lift the machine off the skid. Place it on the pedestal if available.	The machine weighs 170 kg, requiring four persons to lift.
3	Push in the grip bars.	
4	Open the accessories box, and take out its contents. Hold the M, C, Y, and Bk starter developers, and shake them well; thereafter, detach the funnel, peel the seal and attach the funnel back on. Store it inside the pedestal or in a dust-free location. The environmental sensor checks the humidity of the room, and uses this information to adjust some of the copier's operations. Exposing the starter developers to room conditions, at this time, will allow them to adapt to the working environment.	Check that the following are available: • Copy tray • Manual feed tray, Size label • Document tray; 2 stepped screws • Drum cleaner lubricant • Silicone oil bottle • Security key, Door switch lever • Hopper cap (4 pcs.) • Drum bushing (2 pcs.); 4 screws • Developing assembly duct (lower); 1 screw • Developing assembly duct (middle); 1 screw • Photosensitive drum • Photosensitive drum unit (excluding the photosensitive drum, but including the pre-cleaning corona unit); 2 screws • OPERATOR'S MANUAL • White density calibration plate, Bag (1 pc.); CLC350 only

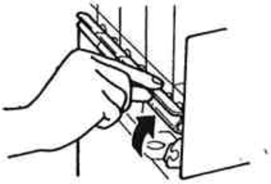
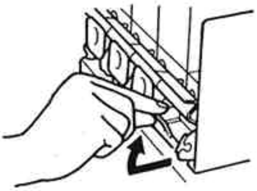
B. Removing the Fixings and Fasteners

Step	Work	Remarks
1	Peel the shipping tape from the machine.	
2	Open the front door, and remove the shipping tape and styro foam blocks; i.e., from levers, etc.	Remove the transparent cover from the top of the hopper and the oil cup immediately before setting the bottle. Set the large-capacity waste toner case if the pedestal is expected to be in use.
3	Remove the copyboard glass retainer (right; 2 screws), and rėmove the copyboard glass.	 Mirror mount fixing Copyboard glass Copyboard glass retainer (right) Mirror mount fixing Figure 5-46
4	Remove the two mirror mount fixings (2 screws each). The fixings will be used when relocating the machine in the future, store it inside the pedestal.	
5	Place the copyboard glass butted against the left end, and mount the copyboard retainer (right). • Do not move the glass retainer found below the copyboard glass retainer (right). • Take care so that the glass will not override the stoppers at the front and rear.	
6	Open the hopper unit (1 screw; release lever), and remove the transfer drum cover (2 release levers; 2 screws).	 Loosen. Fix. transfer push-on sheet (attraction push-on sheet) Figure 5-47
7	Loosen the screw (M3 × 4) shown in Figure 5-4, move the attraction push-on sheet to the point of engagement, and fix it by tightening the screw. • With the machine, you need not remove any screw before engaging the attraction push-on sheet.	
8	Loosen the fixing screw on the transfer push-on sheet, move the push-on sheet to the point of engagement, and fix it by tightening the screw. • No screw is to be removed from the transfer push-on sheet.	
9	Attach the transfer drum cover using two screws.	

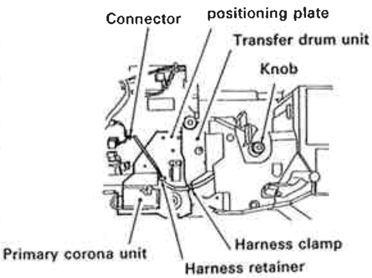
Step	Work	Remarks
10	Remove the four fixing plates from the developing assembly and developing assembly shift base; 5 screws in total. The three fixing plates on the left may be used as door switch actuators store them.	 Figure 5-48
11	Fit the four screws shown in Figure 5-48 which hold the developing assembly in place; of those removed in step 10.	
12	Open the delivery assembly, and pull out the two fixing roller release blocks; then, remove the tape from the cleaning belt sensor lever, and close the delivery assembly.	

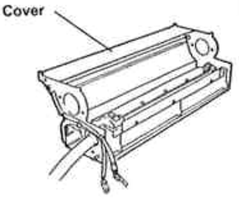
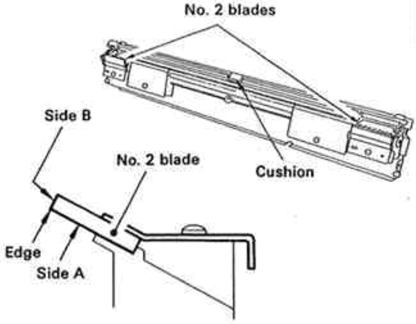
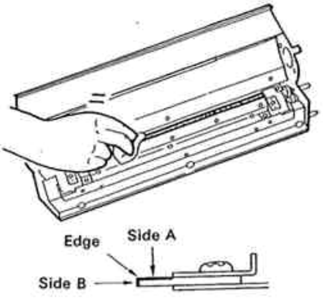
C. Attaching the Toner Bottle and the Oil Bottle

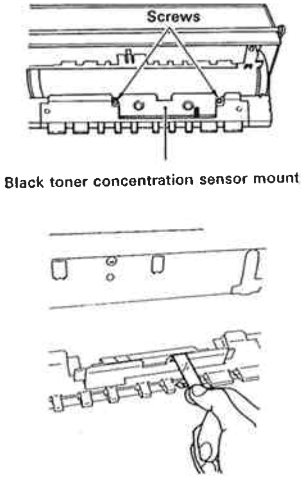
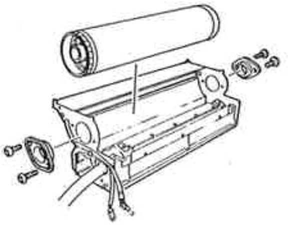
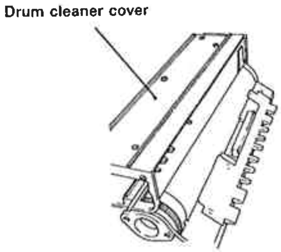
Step	Work	Remarks
1	Place copy paper under the hopper, and fit the stoppers into the four holes found in the bottom of the hopper. • Make sure that the stoppers are all the way in.	 Figure 5-49
2	Shake the M toner bottle up and down gently; about five up/down motions.	 Figure 5-50
3	Remove the transparent cover from the top of the hopper, pull the fixing lever down, fit the M toner bottle into the cut-out of the bottle fixing lever, and push it in while turning it. • Set the bottles in order, i.e., M, C, Y, and Bk from right to left.	 Figure 5-51

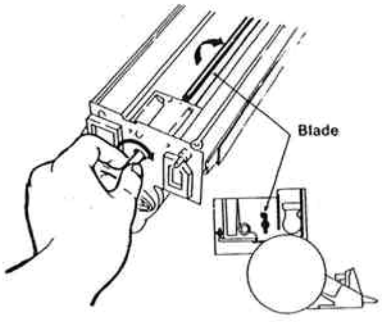
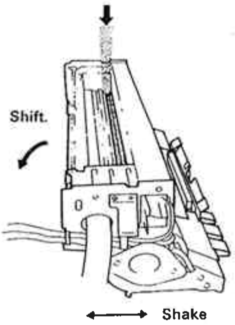
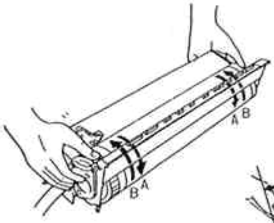
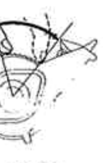
Step	Work	Remarks
4	Shift the bottle fixing lever up.	 Figure 5-52
5	Set the C, Y, and Bk toner bottles as for the M toner bottle.	
6	Pull out the shutter levers of the M, C, Y, and Bk toner bottles toward the front, and shift them up.	 Figure 5-53
7	Remove the oil cup, and insert the oil bottle.	

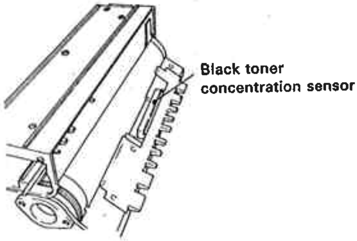
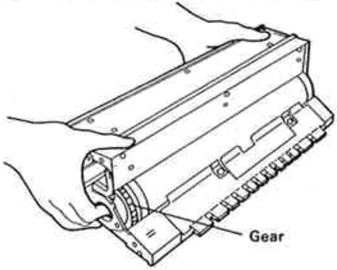
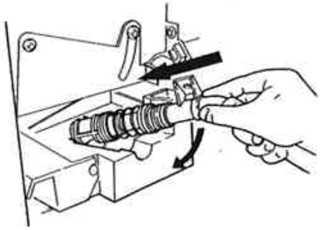
D. Attaching the Photosensitive Drum

Step	Work	Remarks
1	Remove the primary corona unit (1 connector).	 Photosensitive drum positioning plate Connector Transfer drum unit Knob Primary corona unit Harness clamp Harness retainer Figure 5-54
2	Disconnect the three connectors of the harness coming from the transfer drum, and detach the harness from the harness retainer and harness clamp (1 screw).	
3	Remove the photosensitive drum positioning plate (2 screws).	

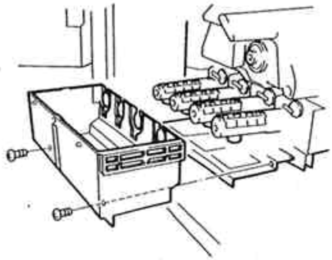
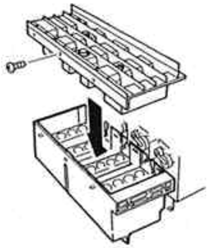
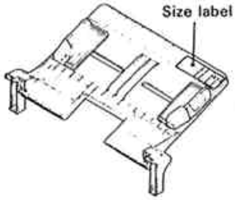
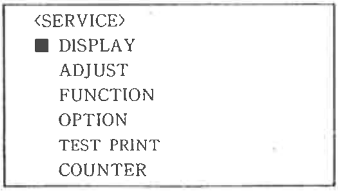
Step	Work	Remarks
4	Remove the dummy drum. Store the dummy drum for use when relocating the machine.	Keep the dummy drum level while removing it.
5	Remove the drum stopper from the photosensitive drum bushing (1 screw).	
6	Take out the pre-cleaning corona unit from the drum unit.	
7	Remove the two screws, and detach the cover shown in the illustration.	 Figure 5-55
8	Apply the drum cleaner lubricant evenly on the No.2 blades found on both ends of the cover (inside). • Shake the lubricant well before application. • Apply to sides A and B as well as the edges of the blades. • Tap it lightly; do not rub, or the edge may chip. • Apply to the surface and edge of the cushion as well.	 No. 2 blades Side B No. 2 blade Cushion Edge Side A Figure 5-56
9	Apply the drum cleaner lubricant evenly on the edge of the photosensitive drum cleaner. • If uneven, copies may show white vertical lines. • Apply to sides A and B as well as the edge of the blade. • Tap it lightly; do not rub, or the edge may chip.	 Figure 5-57

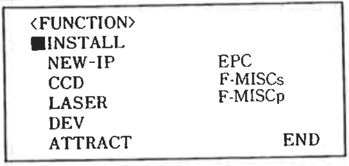
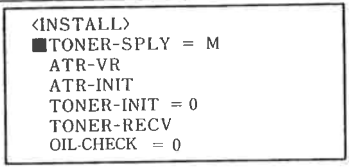
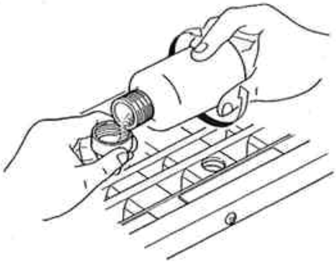
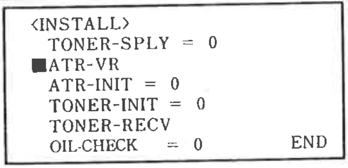
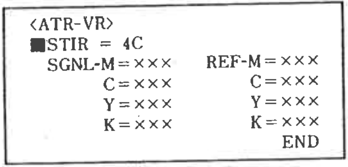
Step	Work	Remarks
10	Remove the two screws, and shift the black toner concentration sensor mount (up). • Fix it in place using tape. • Take care not to bring the tape into contact with the photosensitive drum.	 Figure 5-58
11	Detach the light-blocking sheet, place the photosensitive drum on the drum unit, and fix it in place using two bushings and two screws (accessory). • Attach it so that the gear of the photosensitive drum faces the waste toner hose.	 Figure 5-59
12	Attach the cover detached in step 7 using two screws.	
13	Turn the drum unit upside down, and place it on a sheet of paper laid on a desk. Hold the drum unit; remove the five screws, and detach the cover from the photosensitive drum cleaner.	 Figure 5-60

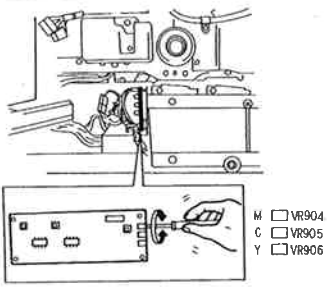
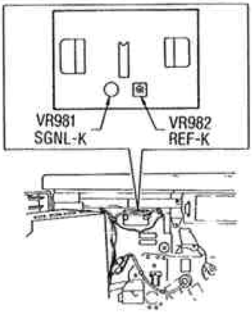
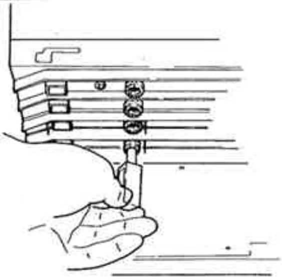
Step	Work	Remarks
14	Check the position of the blade inside the drum cleaner. If the blade is not vertical, turn the drive shaft at the rear of the drum cleaner to correct the orientation.	 Figure 5-61
15	Shake the drum cleaner lubricant (accessory) well, and detach the cap. Pour a capful (about 5 g) of lubricant over the drum surface starting at the cleaner; make sure the layer of lubricant is even toward the front rear. • If uneven, copies may show white vertical lines. • Store away the remaining lubricant for use at time of drum replacement.	 Figure 5-62
16	Attach the cover detached in step 13 to the photosensitive drum cleaner using five screws.	
17	Shake it as shown in the illustration.	
18	Shift it with care as shown in the illustration.	
19	Hold both ends of the drum with fingers, and give it a half turn in the direction of A. • The shift causes the lubricant to spread over the drum surface; be sure to shift it in the direction of A first. • Give a push four times over the length shown in the illustration to make about a half turn.	 Figure 5-63  Figure 5-64
20	Give it a half turn in the direction of B. • The shift in the direction of B causes the lubricant poured in step 15 to move between the drum and the blade, preventing faulty cleaning.	
21	Repeat steps 19 and 20 five times; then, give it a 1/2 turn in the direction of B, thereby returning the lubricant fully to the cleaning assembly.	

Step	Work	Remarks
22	Wipe the window of the black toner concentration sensor using lint-free paper moistened with alcohol. • Use alcohol with high-purity. • Do not dry wipe it to prevent spread of dirt. • Do not touch the photosensitive drum.	 **Figure 5-65**
23	Check that the sensor face of the black toner concentration sensor mount has dried, and bring the sensor into its original position (2 screws). • Take care not to touch the photosensitive drum.	
24	Move the developing assembly shift base to its home position, and insert the photosensitive drum into the drum bushing along the rail. • Take care not to bring the harness from the transfer drum into contact with the photosensitive drum. • It is in its home position if the space between the M and C developing assemblies is found directly below the photosensitive drum. • The drum unit will stop when inserted about 5 cm because a guide pin on the drum shaft must fit through the drum for proper positioning. Keep the drum unit level, and push it slowly while turning the gear of the drum counterclockwise; do NOT turn it clockwise. Continue until drum unit slides in smoothly.	 **Figure 5-66**
25	Connect the two connectors coming from the drum unit.	
26	Mount the stopper removed in step 5 inside the drum bushing using a screw.	 **Figure 5-67**
27	Detach the air cap sheet from the waste toner hose; then, open the toner mouth, and push the hose into the mouth; no screw is needed. • Make sure the hole of the waste toner hose and its receiving hole match.	
28	Mount the photosensitive drum positioning plate (2 screws).	
29	Connect the harness coming from the transfer drum (3 connectors; harness retainer, harness clamp).	
30	Set the primary corona unit, and connect the connector without using the screw.	
31	Set the pre-cleaning corona unit without using the screw.	
32	Position the transfer drum lever.	Check that the front right door closes and opens properly.

E. Attaching the Developing Assemblies

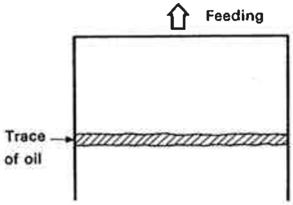
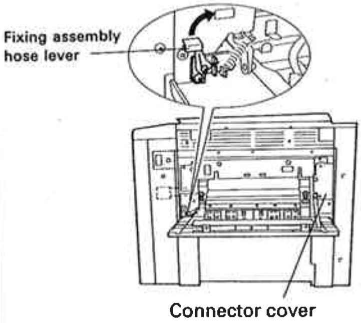
Step	Work	Remarks
1	Move the developing assembly to the right, check that the three connectors on the front of the developing assembly are properly connected, and mount the developing assembly duct (lower; 2 screws). Check the position of the color toner concentration PCB to facilitate the work that follows; see Figure 5-77.	 **Figure 5-68**
2	Engage the hooks at the rear, and mount the developing assembly duct (middle; 1 screw).	 **Figure 5-69**
3	Connect the power plug into the wall outlet, and turn the machine ON.	
4	Insert the door switch actuators into the right and left door switches and the laser shutter; 3 points.	If 'ADD OIL' comes ON during the following steps, turn the machine OFF and ON.
5	Insert the security key.	
6	1) Perform the following during warm-up. • Set paper in the cassette. • Attach the size label on the manual feed tray. • Set the document holder, manual tray, and copy tray. 2) Wait until warm-up is over; then, press the ✳, ◁ , ▷ , and ✳ keys on the control panel in sequence to enter the service mode. Press the ◁ and ▷ keys at the same time.	 **Figure 5-70**
7	Press the ▽ key to move the cursor to 'FUNCTION', and press the OK key.	 ⟨SERVICE⟩ ■ DISPLAY ADJUST FUNCTION OPTION TEST PRINT COUNTER **Figure 5-71**

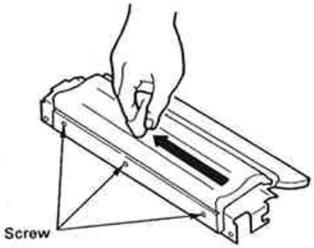
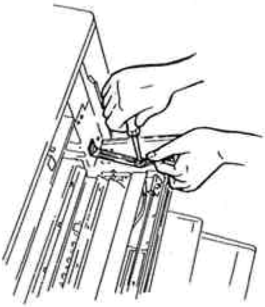
Step	Work	Remarks
8	Press the OK key to select 'INSTALL'.	 <FUNCTION> ■INSTALL NEW-IP EPC CCD F-MISCs LASER F-MISCp DEV ATTRACT END **Figure 5-72**
9	Press the ▷ key to select 'TONER-SPLY=M', and press the OK key. • About 15 sec later, the developing assembly starts to move in response; thereafter, the screw inside the M developing assembly will start to rotate. • Hold the ▷ key down to move from 0 to M, C, Y, and K in sequence.	 <INSTALL> ■TONER-SPLY = M ATR-VR ATR-INIT TONER-INIT = 0 TONER-RECV OIL-CHECK = 0 **Figure 5-73**
10	Pour the starter developer into the developing assembly whose screw is rotating. • Take care; the developing assemblies hold toner of the following colors; from right to left. M: magenta C: cyan Y: yellow Bk:black • Tilt the bottle while turning it slowly. Note: Take care; the developing assembly will automatically return to its home position in about 5 min.	 **Figure 5-74**
11	Press the C/⊘ key to stop the operation.	
12	Perform steps 9, 10 and 11 for C, Y, and Bk toners.	
13	Press the ▽ key to move the cursor to 'ATR-VR', and press the OK key.	 <INSTALL> TONER-SPLY = 0 ■ATR-VR ATR-INIT = 0 TONER-INIT = 0 TONER-RECV OIL-CHECK = 0 END **Figure 5-75**
14	Press the ▷ key six times (or ◁ key once) to select 'STIR=4C', and press the OK key. • The toner inside each developing assembly will be mixed in sequence from M to C, Y, and Bk, and the operation will stop.	 <ATR-VR> ■STIR = 4C SGNL-M=××× REF-M=××× C=××× C=××× Y=××× Y=××× K=××× K=××× END **Figure 5-76**

Step	Work	Remarks
15	Press the ▽ key to move the cursor to 'SGNL-M', and press the OK key; the developing assembly should shift in response. • A buzzer without a break is sounded when the value of 'SGNL-M' falls to 204±3. Turn the topmost VR; turn the VR clockwise if no buzzer is sounded, and turn it counterclockwise if a buzzer is sounded at short intervals. • To adjust the VR, wait at least 15 seconds after the developing assembly has moved.	 **Figure 5-77**
16	Check that the value is 204±3 on the display, and press the C/⊗key.	
17	Press the ▽ key to move the cursor to 'SGNL-C', and press the OK key. Make adjustments as in steps 15 and 16.	Turn the middle VR.
18	Press the ▽ key to move the cursor to 'SGNL-Y', and press the OK key. Make adjustments as in steps 15 and 16.	Turn the bottom most VR.
19	Press the ▽ key to move the cursor to 'SGNL-K', and press the OK key. Adjust VR981 as in steps 17 and 18 so that the reading on the display is **128±3**.	 **Figure 5-78**
20	Press the ▽ key to move the cursor to 'REF-K', and press the OK key. Make sure that the REF-K value is 204±3 and press the C/⊗ key. If the value is not correct, adjust VR982 according to steps 15 and 16.	
21	Press the RESET key, pull out the door switch actuator.	
22	Remove the hopper stop with care; place paper under the hopper.	 **Figure 5-79**
23	Close the hopper assembly and secure with a screw. Close the front door.	

Step	Work	Remarks
24	Wait until warm-up is over; then enter the service mode once again (✱, ◁;▷ , ✱), and select 'FUNCTION' and then 'INSTALL' in succession.	〈INSTALL〉 TONER-SPLY = 0 ATR-VR ■ATR-INIT TONER-INIT = 0 TONER-RECV OIL-CHECK = 0 END Figure 5-80
25	Press the ▽ key to move the cursor to 'ATR-INIT', and press the OK key.	
26	Press the ◁ key to select 'INIT=3C', and press the OK key. • The machine reads the value of SGNL-M, REF-M, SGNL-C, REF-C, SGNL-Y and REF-Y and stops automatically. • If 'E020' comes ON, turn the machine OFF and ON, and start with step 24. • Take notes of the six values. Record the values on the Service Mode Label behind the left cover after installation.	〈ATR-INIT〉 ■INIT = 3C SGNL-M = ××× REF-M = ××× C = ××× C = ××× Y = ××× Y = ××× K = ××× K = ××× END Figure 5-81
27	Press the ▷ key to select 'INIT=K', and press the OK key. • 'INIT=K2' and 'INIT=K3' may be skipped.	The machine reads the values of SGNL-K and REF-K and stops automatically.
28	Select 'END', and return to 'INSTALL'.	〈INSTALL〉 TONER-SPLY = 0 ATR-VR ATR-INIT ■TONER-INIT = 4C TONER-RECV OIL-CHECK = 0 END Figure 5-82 • Toner is fed to the hopper outlet and stopped automatically.
29	Press the ▽ key to position the cursor on 'TONER-INIT'.	
30	Press the ◁ key to select 'TONER-INIT=4C', and then press the OK key.	
31	Press the RESET key.	

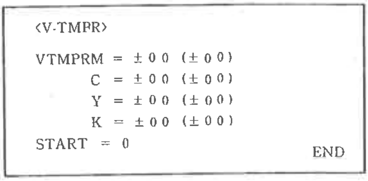
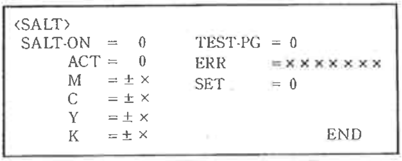
F. Checking the Fixing Oil

Step	Work	Remarks
1	Select A3 or A4 using the CASSETTE SELECT key, and enter the service mode; ✳, ◁ ; ▷ , ✳.	
2	Select 'FUNCTION' and then 'INSTALL'.	<FUNCTION> ■INSTALL NEW-IP EPC CCD F-MISCs LASER F-MISCp DEV ATTRACT END **Figure 5-83**
3	Press the ▽ key to select 'OIL-CHECK', and press the right key to select 'OIL-CHECK=1'. • A press on the COPY START key causes a blank sheet to be delivered after about 30 sec. Go to step 13 if, as shown in Figure 5-85, the oil stain continues across the paper without a break. Go to the next step if there is any break in the stain.	<INSTALL> TONER-SPLY = 0 ATR-VR ATR-INIT = 0 TONER-INIT = 0 TONER-RECV ■OIL-CHECK = 0 END **Figure 5-84**  **Figure 5-85**
4	Turn the power switch OFF, and disconnect the power plug; then, detach the fixing assembly. 1) Lower the manual feed lever, and remove the front right cover (1 screw). 2) Remove the connector cover (1 screw), and remove the three connectors. 3) Remove the screw, and release the fixing assembly hose lever; the oil hose will move up. 4) Remove the four fixing screws. 5) Pull out the fixing assembly, and remove the fixing assembly by holding its grips.	 **Figure 5-86**
5	Release the lock levers at the front and rear of the fixing assembly (1 screw each), and open the top of the fixing assembly.	

Step	Work	Remarks
6	Remove the oil application felt together with its mount (2 screws). • Take care so that the silicone oil will not drip outside the oil tub; e.g., over the inlet guide.	 Figure 5-87
7	Place a newspaper or waste paper. Drip oil onto lint-free paper by tilting the oil bottle. Rub the oil-soaked lint-free paper over the section of the felt that comes into contact with the upper fixing roller; remove the three screws, and put oil on the back side of the felt also.	
8	Fit the three screws back in, and mount the oil application felt (2 screws).	Take care so that the silicone oil will not drip outside the oil case, i.e., inlet guide, etc.
9	Close the top of the fixing assembly, and fix it by the lock lever (2 screws).	Check that the belt detection lever is in contact with the cleaning belt.  Figure 5-88
10	Mount the fixing assembly (4 screws, 3 connectors).	
11	Lower the fixing assembly hose lever, and tighten the screw; the oil hose will move down.	
12	Mount the connector cover (1 screw) and front right cover (1 screw).	
13	Loosen the screw that holds the tape at the rear of the delivery unit, and tighten it as shown in Figure 5-45 while lifting the delivery unit.	

G. Adjusting the Image and Others

Step	Work	Remarks
1	Set the Test Sheet on the copyboard, and check the copy operation. • Make sure that copies are made in specified numbers. • Make sure that there is no abnormal sound. • Check the copy quality.	
2	Execute the work shown on the right if the copy density is not correct.	1) Enter the service mode, and select 'ATR-VR'. 2) Select 'STIR=4C', and press the OK key. Repeat the above twice.

Step	Work	Remarks
3	Check the copy density once again; if the density is still wrong, adjust the contrast as instructed for installation work. 1) Select 'V-TMPR' of 'ADJUST'. 2) Lower the value of 'VTEMPR' if the density is too high; raise the value of 'VTMPR' if the density is too low. 3) Set 'START=1', and press the OK key. 4) Select 'END', and enter 'FUNCTION'.	 ⟨V-TMPR⟩ VTMPRM = ±0 0 (±0 0) C = ±0 0 (±0 0) Y = ±0 0 (±0 0) K = ±0 0 (±0 0) START = 0 END **Figure 5-89**
4	Adjust the concentration of the toner on the drum as follows: 1) Enter the service mode. 2) Select 'FUNCTION' and then 'SALT'. 3) Press the ▷ key to set 'SALT-ON=1' and 'SET=1', and press the OK key. 4) Press the ▷ key to set 'SALT-ACT=1', and press the OK key. • Execute drum toner concentration adjustment for about 3 minutes. • Check that all ERR is '0'; otherwise, see the descriptions on the service mode in the SERVICE HANDBOOK. 5) Press the ▽ key to select 'END', then, press the OK key. 6) Select 'ATR-INIT' under 'INSTALL'; then, press the OK key with 'INIT=K' selected. See Remarks. 7) Execute 'END' twice to return to 'FUNCTION'. Then, select 'SALT' once again. 8) Press the ▷ key to set 'TEST-PG=1', and press the COPY START key. • Keep the samples in the pedestal. 9) Press the RESET key to leave the service mode.	 ⟨SALT⟩ SALT-ON = 0 ACT = 0 M = ± × C = ± × Y = ± × K = ± × TEST-PG = 0 ERR = × × × × × × × SET = 0 END **Figure 5-90** Take notes of the readings of 'SGNL-K' and 'REF=K'. • After installation, record the readings on the Service Mode label behind the left cover.
5	Set the Test Sheet on the copyboard, and check the copy operation and copy quality.	Check the copy quality; if not normal, make adjustments as shown in BASIC IMAGE ADJUSTMENT PROCEDURE.
6	Set the users options mode to suit the needs of the user.	
7	Adjust the feet of the machine using the level gauge (CK-0059); the machine needs to be kept level to keep its liquid consumables (oil, in particular) level.	If the floor is not sturdy or not level, use a sturdy plate (steel) larger than the bottom size of the machine.
8	Fill out the Service Sheet.	
9	In the case of the CLC350, put the white density calibration plate in a bag and attach it to the outside of the rear cover.	Make sure that the bag will not block the duct and will not be exposed to light from the sun.

III. RELOCATION

If the machine needs to be relocated by truck or other means of transportation, perform the following:

Step	Work	Remarks
1	Remove all developing assemblies.	Transport the assemblies in a separate box.
2	Cover the supply opening of the hopper using tape.	
3	Fix the mirror mount using its styro foam blocks.	
4	Remove the drum unit, and set the dummy drum.	Transport the drum unit in a separate box.
5	Remove the oil bottle.	Transport the oil bottle in a separate box.
6	Remove the upper oil case, and empty it of oil. Mount the upper oil case on the fixing assembly, and mount the fixing assembly.	
7	Fix the release lever and knobs around the transfer drum using tape.	
8	Fix the front door and delivery unit using tape.	

IV. MOUNTING THE DOCUMENT TRAY

1) Fit the two stepped screws (accessory) on the right or left side of the copying machine.
2) Fit the document tray on the stepped screws, push it down, and fix it in place.

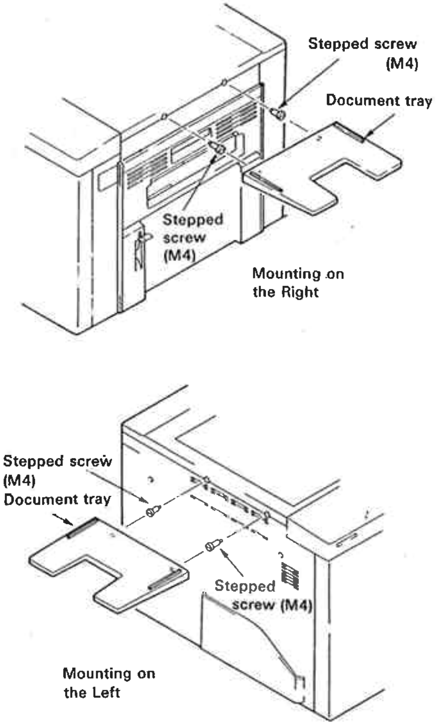

Stepped screw (M4)
Document tray
Stepped screw (M4)
Mounting on the Right
Stepped screw (M4)
Document tray
Stepped screw (M4)
Mounting on the Left

Figure 5-91

V. SETTING THE CASSETTE SIZE

The cassettes used for the copying machine may be sized to suit the needs of the user; to do this, adjust the rear end plate and size plate to the indexes on the cassette, screw them, and set the size detection rollers as shown in Table 5-1.

- Small Size Cassettes

Note:
The machine will not accommodate STMT.

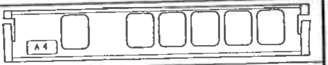
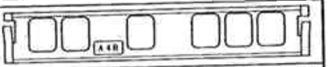
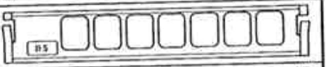
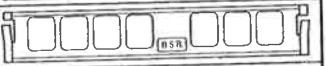
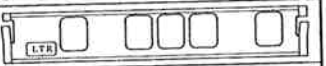
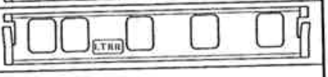
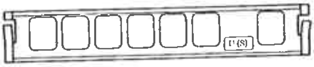
Paper size	Cassette size	Index	Cassette size detection rollers (viewed from rear)
A4	297 mm×210 mm (11.7″×8.3″)	A4	
A4-R	210 mm×297 mm (8.3″×11.7″)	A4R	
B5	257 mm×182 mm (10.1″×7.2″)	B5	
B5-R	182 mm×257 mm (7.2″×10.1″)	B5R	
LETTER	279 mm×216 mm (11.0″×8.5″)	LTR	
LETTER-R	216 mm×279 mm (8.5″×11.0″)	LTR-R	
ARG.LTR (Argentine-LETTER)	280 mm×220 mm (11.0″×8.7″)	U (S)	 Set the copy paper size in the service mode.
G (Government-LETTER)	267 mm×203 mm (10.5″×8.0″)		
K (Korean-Government)	265 mm×190 mm (10.4″×7.5″)		
ARG.LTR-R (Argentine-LETTER-R)	220 mm×280 mm (8.7″×11.0″)		
G-R (Government-LETTER-R)	203 mm×267 mm (8.0″×10.5″)		
K-R (Korean-Government-R)	190 mm×265 mm (7.5″×10.4″)		

Table 5-1a

■ Large Size Cassettes

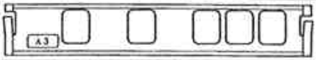
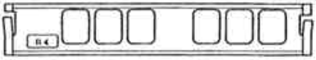
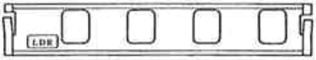
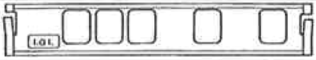
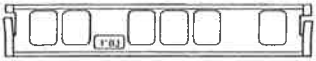
Paper size	Cassette size	Index	Cassette size detection rollers (viewed from rear)
A3	297 mm×420 mm (11.7"×16.5")	A3	
B4	257 mm×364 mm (10.1"×14.3")	B4	
LEDGER	297 mm×432 mm (11"×17")	LDR	
LEGAL	216 mm×356 mm (8.5"×14.0")	LGL	
ARG.LGL (Argentine-LEGAL)	220 mm×340 mm (8.7"×13.4")	U (L)	 Set the copy paper size in the service mode.
FLS (Foolscap)	216 mm×330 mm (8.5"×13")		
OFC (OFFICIO)	216 mm×317 mm (8.5"×12.5")		
FOLIO	210 mm×330 mm (8.3"×13")		
AUS.FLS (Aus. Foolscap)	210 mm× 337 mm (8.1"×13.3")		
G.LGL (Government-LEGAL)	203 mm×330 mm (13"×8")		
BLV (Bolivian OFICIO)	216 mm×355 mm (8.5"×14.0")		
E.ARG.OFC (Equadoran OFICIO)	220 mm×320 mm (8.7"×12.6")		

Table 5-1b

VI. MOUNTING THE SOCKET FOR CONTROL COUNTER II/CONTROL CARD III (CCII/CCIII)

1) Remove the upper right cover.
2) Remove the two screws, and remove the socket support plate.

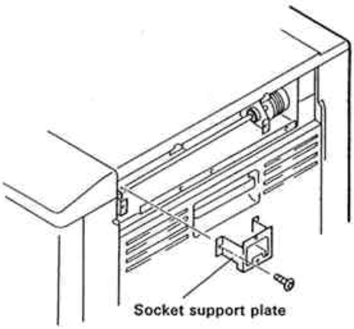


Figure 5-92

3) Mount the socket on the socket support plate using two flat-headed screws.

Note:
Mount the socket so that the arrow on it faces up.

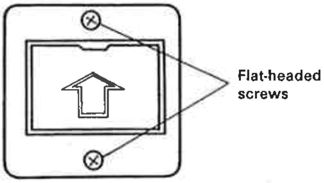


Figure 5-93

4) Remove the inside right cover and counter cover of the copying machine.
5) Loosen the three screws that hold the control panel in place, remove the two connectors, and turn over the control panel.
6) Disconnect the shorting connector from the connector (4P) found below the control panel; see Figure 5-96.
7) Remove the copyboard glass retainer (right; 2 screws).
8) Remove the four screws A, which hold the upper cover of the copying machine, and loosen the screw B.
9) Remove the face plate from the front.

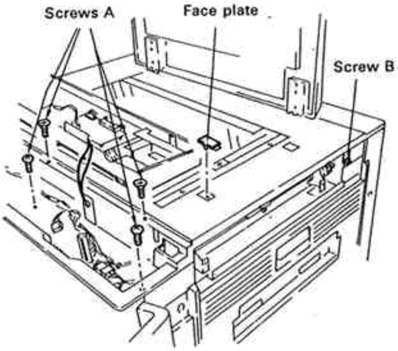


Figure 5-94

10) Lift the upper cover of the copying machine somewhat, and lead the two connectors (4P, 1P) through the hole of the upper cover all the way to the edge saddle found on the socket.

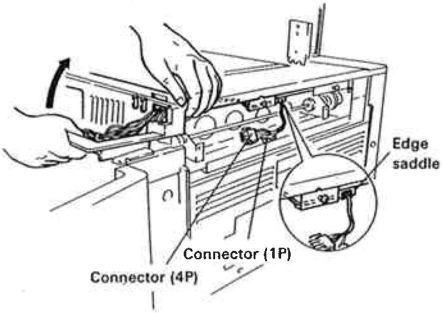

Edge saddle
Connector (1P)
Connector (4P)

Figure 5-95

Note:
Lead the harness through the edge saddle along the AC cable; take care to avoid contact with the scanning system wire and pulley.

11) Connect the connectors coming from the socket to the 4P connector (machine) and 1P connector (machine harness).

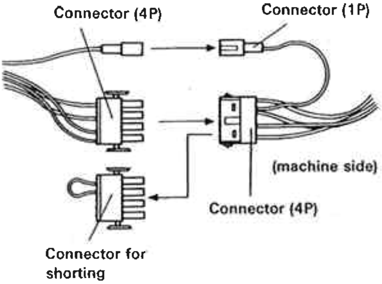

Connector (4P)
Connector (1P)
(machine side)
Connector (4P)
Connector for shorting

Figure 5-96

12) Mount the socket support plate on its original place using two screws.

- Make sure that the connector is toward the right side of the copying machine (delivery side).

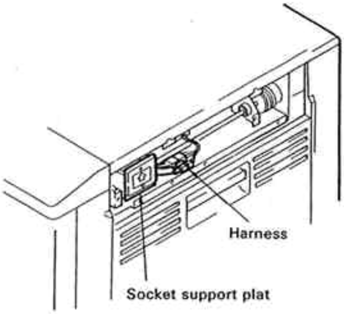

Harness
Socket support plat

Figure 5-97

13) Cut out the blind tab from the upper right cover.

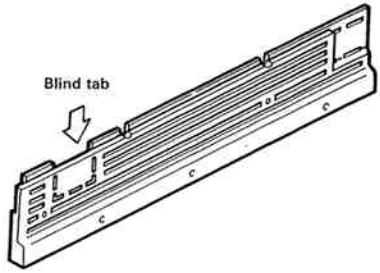


Figure 5-98

14) Mount the upper right cover.
15) Insert Control Counter II or Control Card III, and check the operation of the copying machine and counter.

VII. MOUNTING CONTROL CARD V (CCV)

1) Remove the inside right cover and counter cover from the copying machine.
2) Remove the copy mode memo label, and remove the mounting screw from the blind plate.

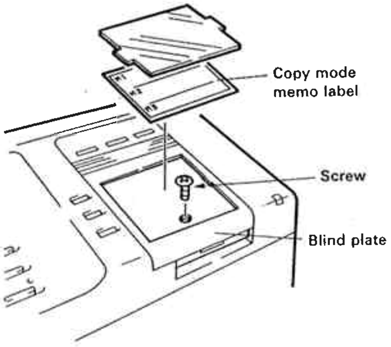


Figure 5-99

3) Loosen the three screws that hold the control panel in place, and turn over the control panel.
4) Remove the mounting plate (2 screws).

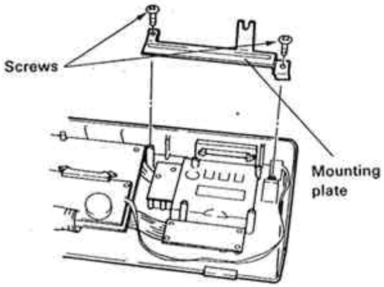


Figure 5-100

5) Remove the blind plate from the card slot.

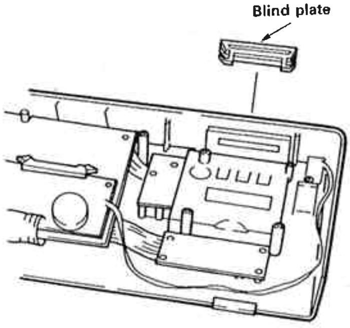


Figure 5-101

6) Attach the insulating sheet on the display hole for Control Card V on the control panel.
7) Detach the protection sheet from the display section of Control Card V.
8) Fix Control Card V on the control panel using four self-tapping screws.

Position Control Card V so that cards can be slid in and out of it without a problem.

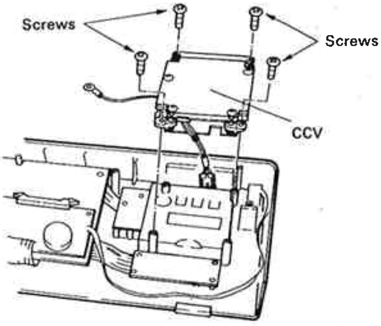


Figure 5-102

Check that the connector for the printer is centered over the hole.

9) Remove the shorting connector, and connect the connector (4P) of Control Card V instead; the connector coming from the machine is behind the control panel.

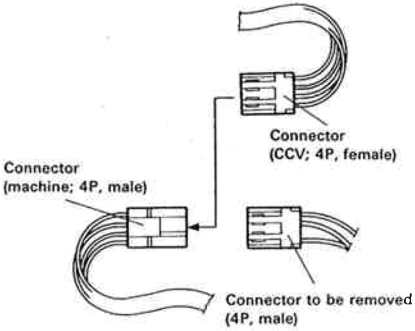

Connector
(CCV; 4P, female)
Connector
(machine; 4P, male)
Connector to be removed
(4P, male)

Figure 5-103

10) Fix the grounding wire of Control Card V using a screw as shown in Figure 5-61.

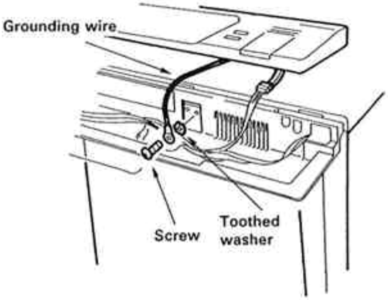

Grounding wire
Screw
Toothed washer

Figure 5-104

11) Detach the protection sheet from the control guide plate of Control Card V.
12) Attach the control guide plate of Control Card V on the control panel of the copying machine.

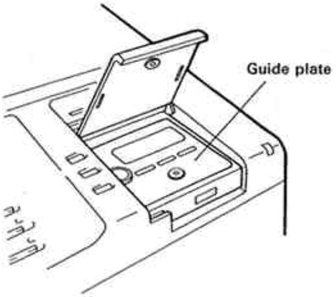

Guide plate

Figure 5-105

13) Mount the control panel on the copying machine.
14) Turn the copying machine ON, and check the operation of Control Card V.
15) Mount the inside right cover and counter cover of the copying machine.

VIII. MOUNTING THE IC CARD* UNIT

1) Remove the inside right cover and counter cover of the copying machine.
2) Loosen the three screws that hold the control panel in place, and turn over the control panel.

Note:
Take note of the connectors and harnesses behind the control panel.

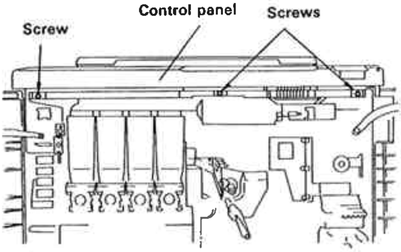

Control panel
Screws
Screw

Figure 5-106

3) Remove the blind plate for the IC Card from the control panel.

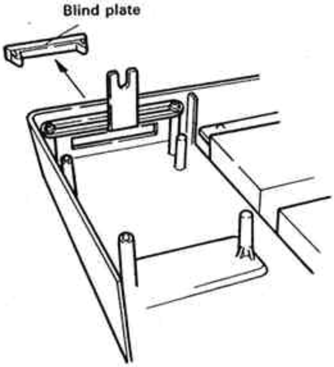

Blind plate

Figure 5-107

4) Mount the insulating sheet and IC card unit on the control panel, routing the harness under the IC card unit.

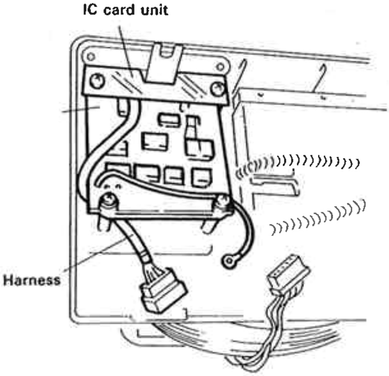

IC card unit
Harness

Figure 5-108

5) Connect the connector, and fix the harness on the IC card unit mounting support using a harness band.

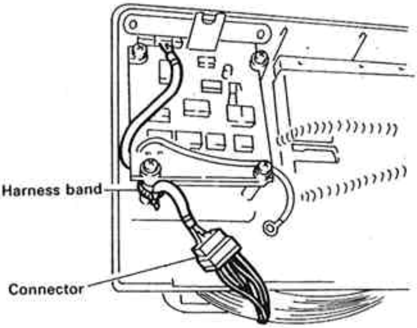

Harness band
Connector

Figure 5-109

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* Innovatron license

6) Fix the grounding wire in place using a screw as shown in Figure 5-110.

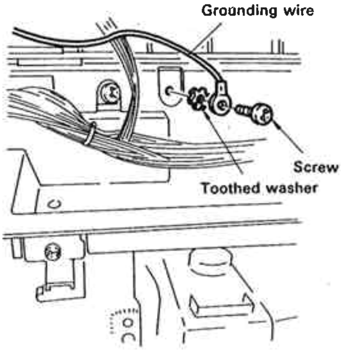

Grounding wire
Screw
Toothed washer

Figure 5-110

7) Mount the control panel.
8) Mount the inside right cover and counter cover of the copying machine.
9) Attach the IC card label next to the IC card slot.

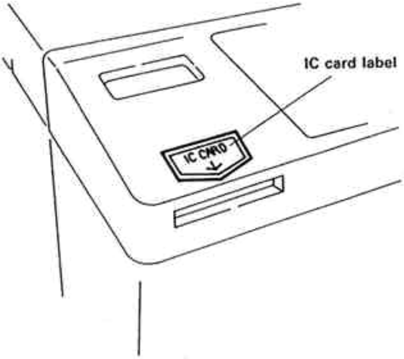

IC card label
IC CARD

Figure 5-111

10) Attach the MC label over the copy mode memo label (M3).

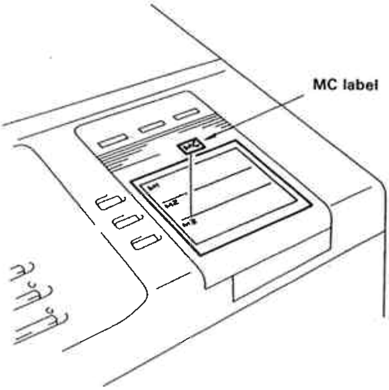


Figure 5-112

11) Attach the 'Innovatron license' seal below the ratings plate on the rear cover of the copying machine.

CHAPTER 6

MAINTENANCE AND SERVICING

I. PERIODICALLY REPLACED PARTS 6-1
II. DURABLES 6-2
III. PERIODICAL SERVICING 6-4
IV. PERIODICAL SERVICING CHART 6-5

I. PERIODICALLY REPLACED PARTS

as of Mar. 1, 1993

No.	Parts name	Parts No.	Q'ty	Life*	Remarks
1	Air filter (FM2, FM3)	FA6-0696-000	2	10,000	
2	Air filter (FM1, FM7)	FA6-0731-000	2	10,000	
3	Air filter (FM9)	FA6-5076-000	1	10,000	
4	Air filter (FM6)	FA6-8601-000	1	20,000	
5	Ozone filter (FM2, FM3×2)	FA6-0695-000	3	20,000	
6	Corona wire	FY3-0030-000	AR	20,000	100 V
		FY3-0040-000	AR	20,000	115/220/240 V
7	Grid wire (primary)	Y81-0162-000	AR	50,000	
8	Brush (drum heater)	FA3-0859-040	1	200,000	CLC200 only

* Expressed in terms of the number of copies made.

Note:
The values shown are estimates only and are subject to change based on future data.

II. DURABLES

as of March 1, 1993

No.	Parts name	Parts No.	Q'ty	Life	Remarks
1	Waste toner case	FY7-0211-020	1	5,000	6 cases; replaced by the user
2	Cleaning blade (photosensitive drum)	FA5-9285-000	1	10,000	
3	Push-on sheet (transfer assembly)	FF2-3877-040	1	10,000	CLC200
4		FF2-5752-000	1	10,000	CLC300/350
5	Fixing oil (1.4 L/bottle; replaced by the user)	KF3-9376-020	1	15,000	CLC200/300
6		FG2-5962-000	1	30,000	CLC350 A4/Letter copy
7	Starter developer (Bk)	F41-6802-000	1	20,000	special
8	Starter developer (C)	F41-6812-000	1	20,000	special
9	Starter developer (M)	F41-6822-000	1	20,000	special
10	Starter developer (Y)	F41-6832-000	1	20,000	special
11	Oil seal (developing assembly)	XG9-0111-000	16	20,000	CLC200 only
12	Oil application felt (fixing assembly)	FA5-8911-000	1	20,000	
13	Side seal (photosensitive drum cleaner)	FF2-2791-050	2	20,000	
14	Side scraper (front; photosensitive drum cleaner)	FA5-9274-000	1	20,000	CLC200
15		FC1-1050-000	1	20,000	CLC300/350
16	Side scraper (rear; photosensitive drum cleaner)	FA5-9288-000	1	20,000	CLC200
17		FC1-1051-000	1	20,000	CLC300/350
18	No. 2 cleaner blade (photosensitive drum)	FA5-9368-030	2	40,000	for 4 edges (10,000/edge)
19	Transfer drum sheet	FY7-0233-040	1	20,000	CLC200 100/220/240 V
20		FY7-0256-000	1	20,000	CLC200 115 V
21		FF2-5741-060	1	20,000	CLC300/350
22	Side scraper (transfer drum)	FF2-2946-000	2	20,000	
23	Push-on sheet (attraction assembly)	FF2-2835-000	1	20,000	CLC200
24		FF2-5746-000	1	20,000	CLC300/350
25	Scanning lamp	FH7-3192-000	1	20,000	

No.	Parts name	Parts No.	Q'ty	Life	Remarks
26	Upper fixing roller	FA9-2151-000	1	20,000 or 1 yr.*	CLC200/300
27		FB1-9435-000	1	50,000 or 2 yrs.*	CLC350
28	Lower fixing roller	FA5-8752-020	1	50,000 or 1 yr.*	CLC200/300
29		FB1-9436-000	1	50,000 or 2 yrs.*	CLC350
30	Side seal (developing assembly)	FA5-9402-000	8	40,000	CLC200 only
31	Scoop-up sheet (photosensitive drum cleaner)	FF2-2994-000	1	50,000	
32	Attraction roller cleaner	FF2-4154-080	1	100,000	50,000 if CLC200
33	Cleaning blade (fixing assembly)	FA5-8753-000	1	100,000	for 2 edges (50,000/edge)
34	Cleaning belt (fixing assembly)	FA6-1660-000	1	100,000	
35	Pick-up roller (front, pick-up assembly)	FF9-1314-000	2	100,000	CLC200/300
36		FF5-1838-000	2	100,000	CLC350
37	Pick-up roller (rear, pick-up assembly)	FF9-1315-000	2	100,000	CLC200/300
38		FF5-1839-000	2	100,000	CLC350
39	Feeding roller (pick-up assembly)	FA5-9637-000	2	100,000	CLC200/300
40		FF5-1843-000	2	100,000	CLC350
41	Separation roller (pick-up assembly)	FA4-8991-000	2	100,000	CLC200/300
42		FF5-1830-000	2	100,000	CLC350
43	Cleaning brush (transfer drum cleaner)	FA4-8874-000	1	100,000	
44	Halogen heater (fixing assembly)	FH7-4270-000	2	100,000	100 V
45		FH7-4271-000	2	100,000	115 V
46		FH7-4272-000	2	100,000	220 V
47		FH7-4273-000	2	100,000	240 V
48	Pre-exposure lamp	FH7-3194-000	1	150,000	

The above values are estimates only and are subject to change based on future data.
*Whichever comes first.

III. PERIODICAL SERVICING

Note:
i. Plan a periodical servicing visit every 5,000 copies.
ii. Check the service record before setting out for a visit, and take parts if replacement is expected.

Step	Work	Checks	Remarks
1	Meet the operator.	Take note of the condition.	
2	Record the counter reading.	Check problem copies.	
3	Make test copies in the DIRECT, REDUCE, and ENLARGE modes.	Check the following: a. Image density b. Background for dirt c. Characters for clarity d. Leading edge for margin e. Right/left and bottom sides for margins f. Fixing and registration; back for dirt g. Abnormal noise h. Counter	Standards: 8±1.5 mm (DIRECT) $-2^{+2.0}_{-1.5}$ mm (DIRECT)
4	Perform necessary periodical servicing to suit the number of copies made; see p. 6-5.		
5	Clean the inside of the machine, if necessary.		
6	Check the waste toner.		
7	Make test copies.		
8	Make sample copies.		
9	Put sample copies in order, and clean up the area around the copying machine.		
10	Record the counter reading.		
11	Fill out the Service Sheet, and report to the operator.		

IV. PERIODICAL SERVICING CHART

Note:
Do not use solvents/oils not specified herein.

△: Clean ●: Replace ×: Oil □: Adjust ◎: Inspect △□: CLC200

Item	Parts	Servicing intervals every 5,000 copies	every 10,000 copies	every 20,000 copies	every 50,000 copies	every 100,000 copies	every 200,000 copies	Remarks
Externals	Copyboard glass	△						Alcohol
	Copyboard cover	△						
	Ozone filter (3 pcs.)			●				
	Air filter (4 pcs.)		●					
	Spring clutch (5 pcs.)				×			Oil
Pick-up/Feed	Attraction roller (lower feeder unit)	△						Alcohol
	Attraction guide	△	△					
	Attraction roller cleaner		△					Remove the build-up of toner, if any; dry wipe it.
	Side scraper (transfer drum)		△					Alcohol
	Push-on sheet (transfer unit)	△						
	Pick-up, Feeder, and Separation rollers (pick-up unit)				△			
	Feeder belt				△			
Laser exposure system	Dustproof glass							as necessary; lint-free paper**
Scanner	Mirrors 1 through 3		△			△		Blower brush* Execute 'WSMP' after cleaning.
	Shade (scanning lamp)		△			△		
	Rail			△×				Alcohol; thereafter, oil
Corona	Corona wire (primary, transfer, separation, external static eliminator)	△		●				Lint-free paper; thereafter, alcohol (no water) Wait until completely dry.
	Corona wire (internal static eliminator, attraction, separation, pre-cleaning)	△	△		●			
	Grid wire (primary corona unit)	△			●			
	Shield plate, Block	△	△					

* Take care not to touch the mirrors and lens; keep the CCD free of dust.
** Take care not to touch the BD mirror or laser mirror; do not damage them.

△ : Clean ● : Replace × : Oil □ : Adjust ◎ : Inspect △□ : CLC200

Item	Parts	Servicing intervals						Remarks
		every 5,000 copies	every 10,000 copies	every 20,000 copies	every 50,000 copies	every 100,000 copies	every 200,000 copies	
Photosensitive drum	No. 2 cleaning blade	△	△***					Remove the build-up of toner, if any; dry wipe it.
	Black toner concentration sensor	△	△***					See Note ****.
Photosensitive drum	Filter (pre-exposure lamp)		△***					Blower brush
	Potential sensor		△***					
	Brush (drum heater)						●	CLC200 only
	Spacer blocks (front, rear; developing assembly stop)	△	△***					Alcohol
	Sensor anti-glare sheet		△***					Dry wipe it; if necessary, use alcohol.
Developing assembly	Spacer rollers (front, rear; drum stop)		△***					Solvent
	Developing assembly duct			△				Remove the build-up of toner, if any; dry wipe it.
	Cylinder drive chain		□		□			Eliminate the slack, if any.
	Screw bushing				△ (every 40,000 copies)			Every 2 replacements of developer CLC300/350 only
Photosensitive drum cleaner	Side seal, Side scraper, Scoop-up sheet		△***					
Fixing assembly	Separation claw		△					Solvent
	Inlet guide		△					
	Blade (lower roller)	△						Lint-free paper
	Thermistor		△					
	Oil application felt		△					Apply oil as needed, and smooth out the felt.

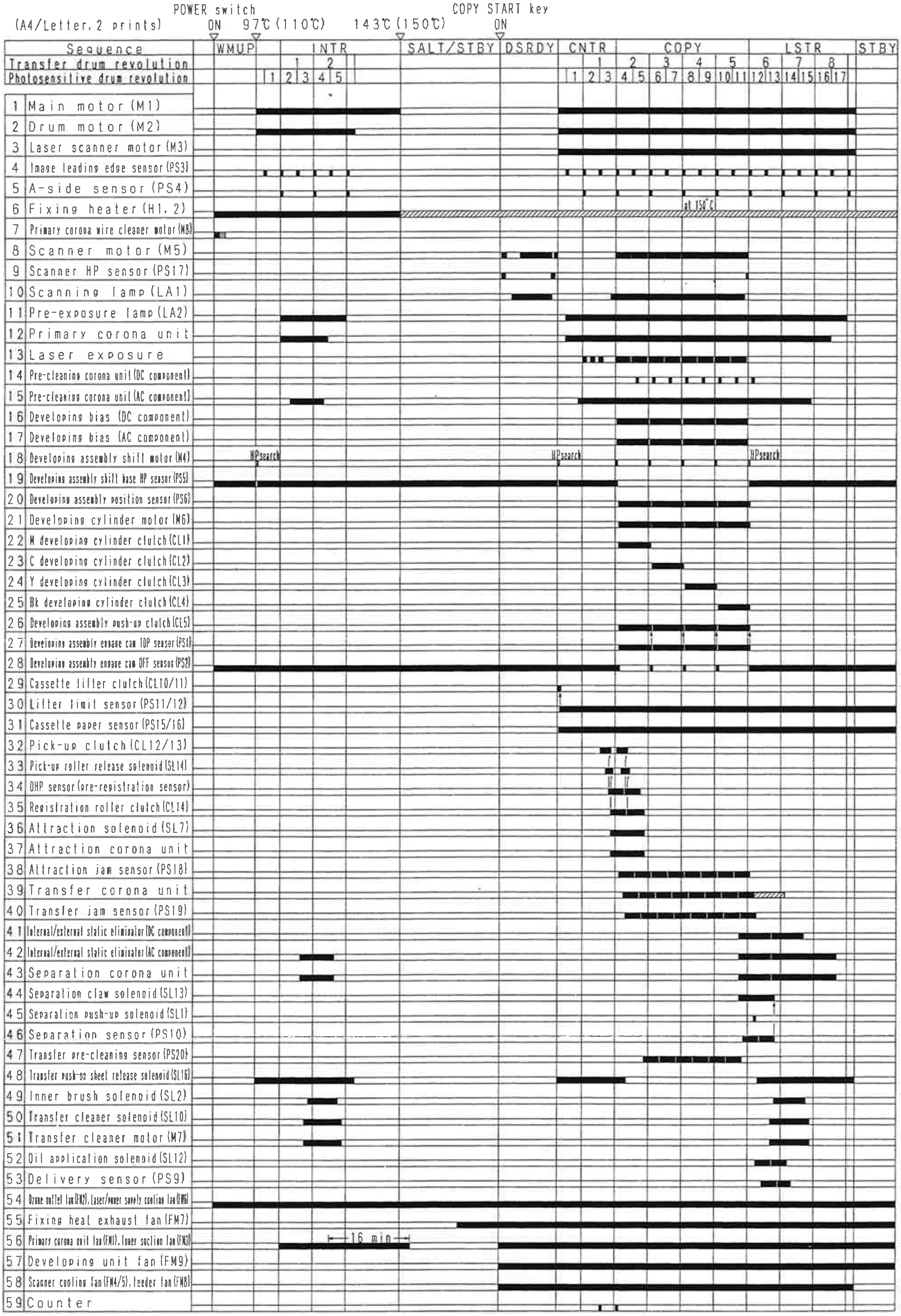
*** Clean when the photosensitive drum is replaced.

**** For the CLC200, dry wipe the black toner concentration sensor; if for the CLC300/350, use alcohol with high-purity, and do not dry wipe it.

APPENDIX

A. GENERAL TIMING CHART A-1
B. LIST OF SIGNALS AND ABBREVIATIONS A-2
C. GENERAL CIRCUIT DIAGRAM A-3
D. DC CONTROLLER CIRCUIT DIAGRAM A-5
E. CCD DRIVER CIRCUIT DIAGRAM A-25
F. ANALOG PROCESSOR CIRCUIT DIAGRAM A-27
G. SCANNER MOTOR DRIVER CIRCUIT DIAGRAM A-31
H. DEVELOPING ASSEMBLY SHIFT MOTOR DRIVER CIRCUIT DIAGRAM A-36
I. HVDC A-39
J. HVAC A-40
K. COLOR TONER CONCENTRATION ADJUSTING CIRCUIT DIAGRAM A-43
L. TONER CONCENTRATION SENSOR CIRCUIT DIAGRAM A-44
M. BLACK TONER CONCENTRATION ADJUSTING CIRCUIT DIAGRAM A-45
N. ENVIRONMENT MEASURING CIRCUIT DIAGRAM A-46
O. POTENTIAL MEASURING UNIT CIRCUIT DIAGRAM A-47
P. IMAGE EDITING UNIT GENERAL CIRCUIT DIAGRAM A-48
Q. IMAGE EDITING UNIT INTERFACE CIRCUIT DIAGRAM A-49
R. OFFSET TRAY GENERAL CIRCUIT DIAGRAM A-54
S. IPU INTERFACE CIRCUIT DIAGRAM A-55
T. SPECIAL TOOLS A-65
U. SOLVENTS AND OILS LIST .. A-67

A. GENERAL TIMING CHART



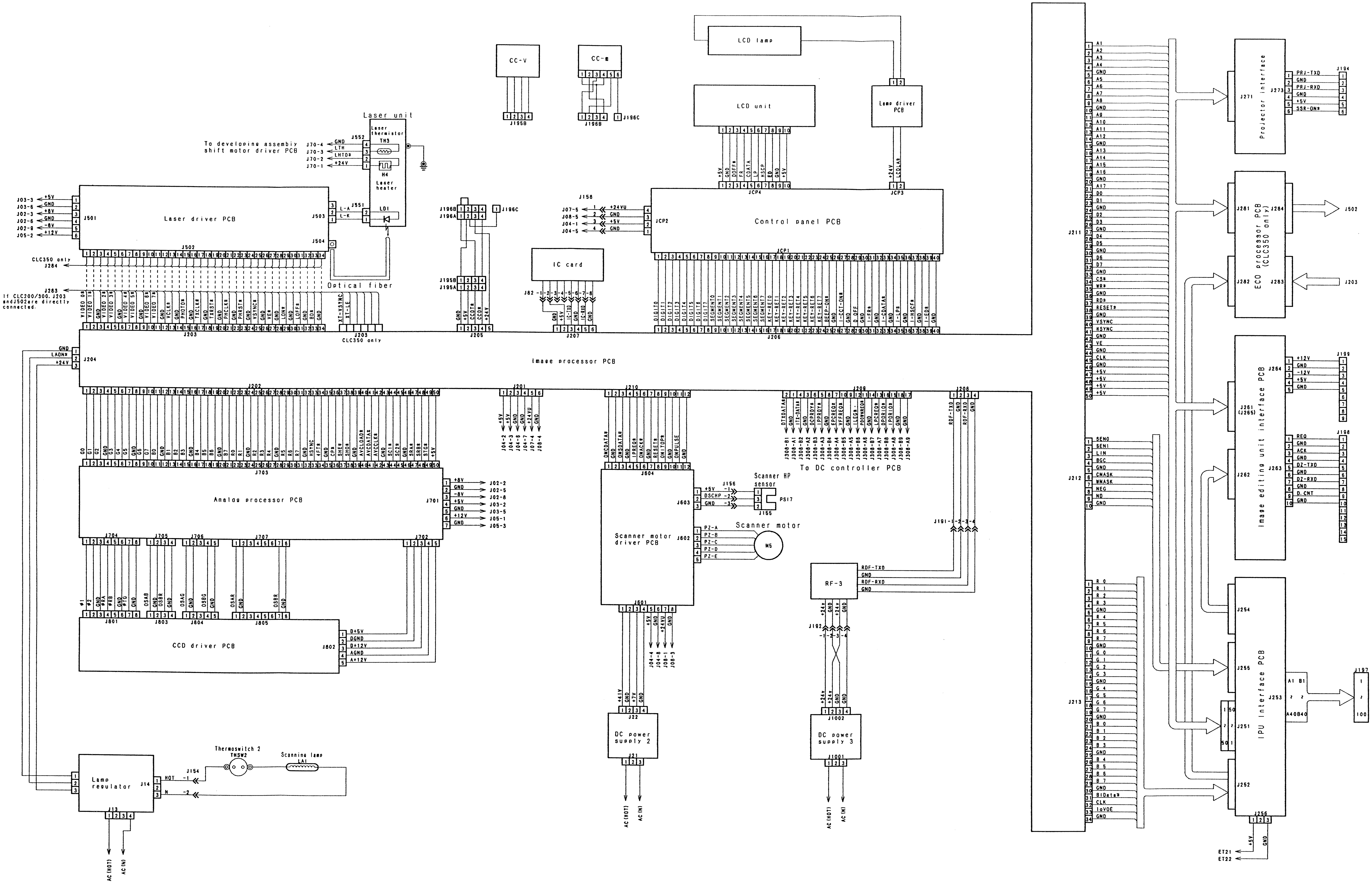
B. LIST OF SIGNALS AND ABBREVIATIONS

SIGNALS

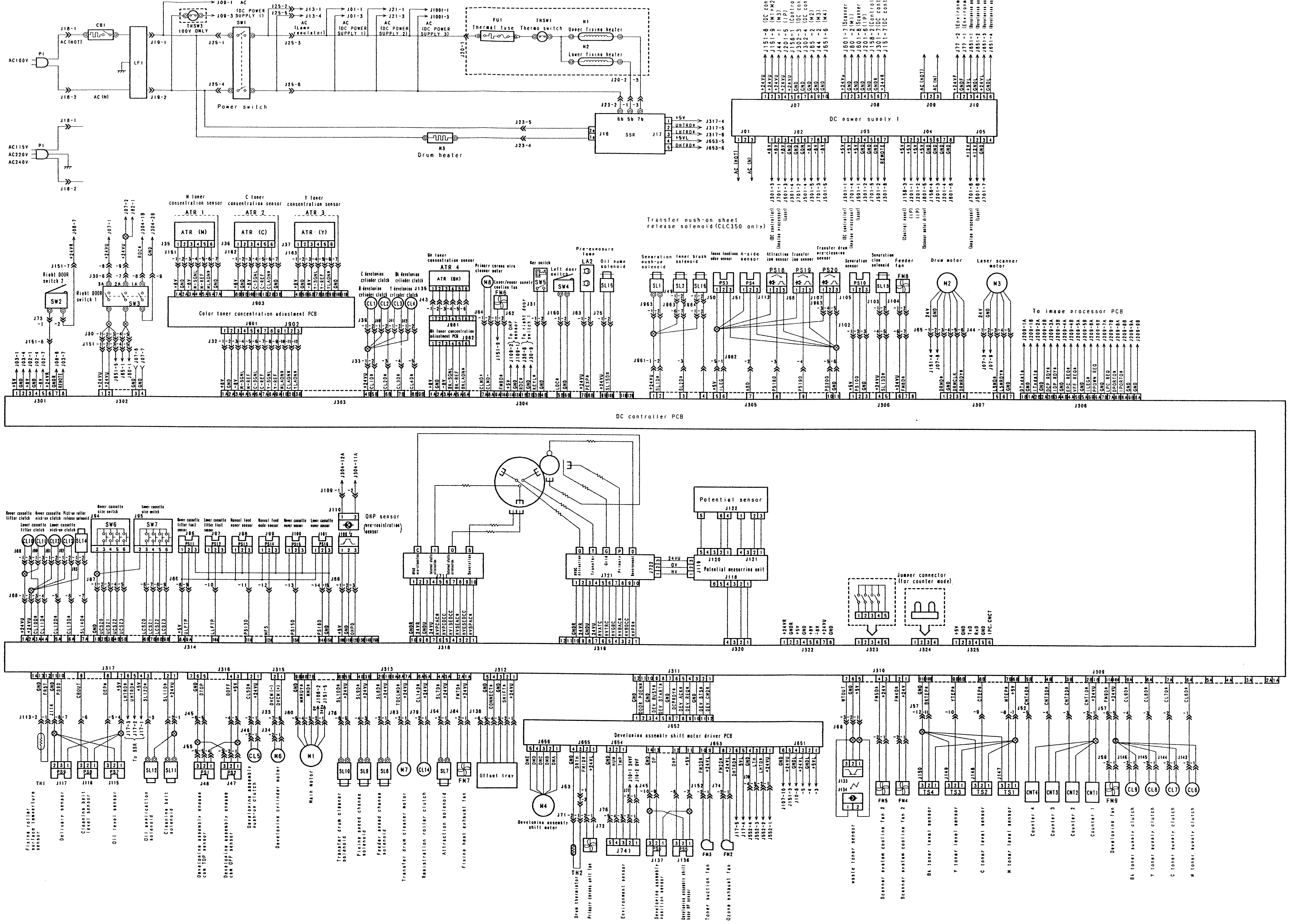
ASD	A-SIDE DETECT signal
BK-REF	BK REFERENCE signal
BK-SGNL	BK TONER CONCENTRATION signal
BKLAON	BK TONER CONCENTRATION DETECT LED ON signal
BKTEP	BK TONER LEVEL signal
C-REF	C REFERENCE signal
C-SGNL	C TONER CONCENTRATION signal
CBOUT	BELT LENGTH signal
CCD	CONTROL COUNTER ON signal
CCDT	CONTROL COUNTER DETECT signal
CL1D	M DEVELOPING CYLINDER CLUTCH DRIVE signal
CL2D	C DEVELOPING CYLINDER CLUTCH DRIVE signal
CL3D	Y DEVELOPING CYLINDER CLUTCH DRIVE signal
CL4D	BK DEVELOPING CYLINDER CLUTCH DRIVE signal
CL5D	DEVELOPING ASSEMBLY PUSH-UP CLUTCH DRIVE signal
CL6D	M TONER SUPPLY CLUTCH DRIVE signal
CL7D	C TONER SUPPLY CLUTCH DRIVE signal
CL8D	Y TONER SUPPLY CLUTCH DRIVE signal
CL9D	BK TONER SUPPLY CLUTCH DRIVE signal
CL10D	UPPER CASSETTE LIFTER CLUTCH DRIVE signal
CL11D	LOWER CASSETTE LIFTER CLUTCH DRIVE signal
CL12D	UPPER CASSETTE PICK-UP CLUTCH DRIVE signal
CL13D	LOWER CASSETTE PICK-UP CLUTCH DRIVE signal
CL14D	REGISTRATION ROLLER CLUTCH DRIVE signal
CLAON	C TONER CONCENTRATION DETECT LED ON signal
CLMD	PRIMARY CORONA WIRE CLEANER MOTOR DRIVE signal
CNT1D	COUNTER 1 DRIVE signal
CNT2D	COUNTER 2 DRIVE signal
CNT3D	COUNTER 3 DRIVE signal
CNT4D	COUNTER 4 DRIVE signal
CONNECT	CONNECT signal
CTEP	C TONER LEVEL signal
DHP	DEVELOPING UNIT SHIFT PLATE HOME POSITION signal
DHTRD	DRUM HEATER DRIVE signal
DOFF	DEVELOPING ASSEMBLY ENGAGE CAM OFF signal
DP	DEVELOPMENT POSITION signal
DRMCLK	DRUM MOTOR CLOCK PULSE signal
DRMD	DRUM MOTOR DRIVE signal
DRMRDY	DRUM MOTOR READY signal
DRTH	DRUM THERMISTOR signal
DSCHP	DOCUMENT SCANNER HOME POSITION signal
DTOP	DEVELOPING ASSEMBLY ENGAGE CAM TOP signal
DVCM	DEVELOPING CYLINDER MOTOR DRIVE signal
FM1D	PRIMARY CORONA FAN DRIVE signal
FM2D	OZONE EXHAUST FAN DRIVE signal
FM3D	TONER SUCTION FAN DRIVE signal
FM4D	SCANNER COOLING FAN 1 DRIVE signal
FM5D	SCANNER COOLING FAN 2 DRIVE signal
FM6D	LASER/POWER SUPPLY COOLING FAN DRIVE signal
FM7D	FIXING EXHAUST FAN DRIVE signal
FM8D	FEEDER FAN DRIVE signal
FM9D	DEVELOPING FAN DRIVE signal
FRST	FIXING ROLLER SURFACE TEMPERATURE signal
HUM	HUMIDITY signal
HVATC	ATTRACTION CORONA CURRENT LEVEL CONTROL signal
HVBAC	DEVELOPING BIAS AC ON signal
HVBDCC	DEVELOPING BIAS DC LEVEL CONTROL signal
HVESEDCC	EXTERNAL STATIC ELIMINATOR CORONA CURRENT DC LEVEL CONTROL signal
HVGBC	GRID BIAS LEVEL CONTROL signal
HVISEDCC	INTERNAL STATIC ELIMINATOR CORONA CURRENT DC LEVEL CONTROL signal
HVPCAC	PRE-CLEANING CORONA CURRENT AC ON signal
HVPCDCC	PRE-CLEANING CORONA CURRENT DC LEVEL CONTROL signal
HVPR	PRIMARY CORONA CURRENT ON signal
HVSEAC	STATIC ELIMINATOR CORONA CURRENT AC ON signal
HVSPAC	SEPARATION CORONA CURRENT AC ON signal
HVTRC	TRANSFER CORONA CURRENT LEVEL CONTROL signal
ILEG	IMAGE LEADING EDGE signal
KEYL	KEY SWITCH signal
LAON	SCANNING LAMP ON signal
LDC	LEFT DOOR SWITCH signal
LHTD	LASER HEATER DRIVE signal
LHTRD	FIXING LOWER HEATER DRIVE signal
LLFTP	LOWER CASSETTE LIFTER LIMIT signal
LSMD	LASER SCANNER MOTOR DRIVE signal
LSMRDY	LASER SCANNER MOTOR READY signal
LTH	LASER THERMISTOR signal
M-REF	M REFERENCE signal
M-SGNL	M TONER CONCENTRATION signal
MFS	MANUAL FEED MODE signal
MLAON	M TONER CONCENTRATION DETECT LED ON signal
MMD	MAIN MOTOR DRIVE signal
MMRDY	MAIN MOTOR READY signal
MTEP	M TONER LEVEL signal
OEP	OIL LEVEL signal
OHPD	OHP/PRE-REGISTRATION DETECT signal
PEXP	PRE-EXPOSURE LAMP ON signal
PS9D	DELIVERY DETECT signal
PS10D	SEPARATION DETECT signal
PS13D	MANUAL FEED PAPER DETECT signal
PS15D	UPPER CASSETTE PAPER DETECT signal
PS16D	LOWER CASSETTE PAPER DETECT signal
PS18D	ATTRACTION JAM DETECT signal
PS19D	TRANSFER JAM DETECT signal
PS20D	TRANSFER DRUM PRE-CLEANING PAPER DETECT signal
RDC	RIGHT DOOR SWITCH 1 signal
SHIFT	SHIFT signal
SL1D	SEPARATION PUSH-UP SOLENOID DRIVE signal
SL2D	INSIDE BRUSH SOLENOID DRIVE signal
SL7D	ATTRACTION SOLENOID DRIVE signal
SL8D	FEEDER SPEED SOLENOID DRIVE signal
SL9D	FIXING SPEED SOLENOID DRIVE signal
SL10D	TRANSFER CLEANER SOLENOID DRIVE signal
SL11D	CLEANING BELT SOLENOID DRIVE signal
SL12D	OIL APPLICATION SOLENOID DRIVE signal
SL13D	SEPARATION CLAW SOLENOID DRIVE signal
SL14D	PICK-UP ROLLER RELEASE SOLENOID DRIVE signal
SL15D	OIL PUMP SOLENOID DRIVE signal
SL16D	TRANSFER PUSH-ON SHEET RELEASE SOLENOID DRIVE signal
TDCLMD	TRANSFER DRUM CLEANER MOTOR DRIVE signal
TMP	TEMPERATURE signal
UHTRD	FIXING UPPER HEATER DRIVE signal
ULFTP	UPPER CASSETTE LIFTER LIMIT signal
WTOUT	WASTE TONER signal
Y-REF	Y TONER REFERENCE signal
Y-SGNL	Y TONER CONCENTRATION signal
YLAON	Y TONER CONCENTRATION LED ON signal
YTEP	Y TONER LEVEL signal

LIST OF ABBREVIATIONS

CNTR	ADJUSTMENT (CONTROL) ROTATION
DSRDY	DOCUMENT SCANNER READY
INTR	INITIAL ROTATION
LSTR	LAST ROTATION
STBY	STANDBY
WMUP	WARM UP ROTATION

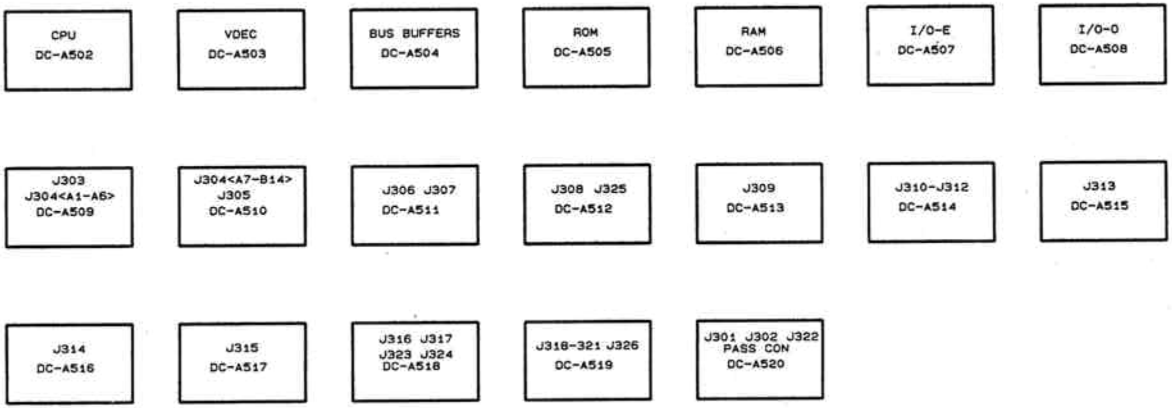

CC-V
CC-Ⅲ
J195B
J196B
J196C
LCD lamp
LCD unit
Lamp driver PCB
Laser unit
Laser thermistor
TH3
H4
Laser heater
LD1
To developing assembly shift motor driver PCB
J552
J551
Laser driver PCB
J501
J502
J503
J504
Optical fiber
CLC350 only J284
J283 If CLC200/300, J203 and J502 are directly connected.
J158
Control panel PCB
JCP1
JCP2
JCP3
JCP4
IC card
J82
J196B
J196A
J195B
J195A
J203
J205
J206
J207
CLC350 only
Image processor PCB
J204
J202
J201
J210
J209
J208
J211
J212
J213
To DC controller PCB
Analog processor PCB
J703
J701
J702
J704
J705
J706
J707
CCD driver PCB
J801
J802
J803
J804
J805
Scanner motor driver PCB
J601
J602
J603
J604
Scanner HP sensor
PS17
J155
J156
Scanner motor
M5
RF-3
J191
J192
DC power supply 2
J21
J22
DC power supply 3
J1001
J1002
AC (HOT)
AC (N)
Lamp regulator
J13
J14
J154
Thermoswitch 2
THSW2
Scanning lamp
LA1
HOT
N
Projector interface
J271
J273
J194
ECO processor PCB (CLC350 only)
J281
J282
J283
J284
J502
J203
Image editing unit interface PCB
J261 (J265)
J262
J263
J264
J199
J198
IPU interface PCB
J251
J252
J253
J254
J255
J256
J197
ET21
ET22

General Circuit Diagram (2/2)


AC100V
AC115V
AC220V
AC240V
P1
CB1
LF1
AC (HOT)
AC (N)
THSW3
100V ONLY
SW1
Power switch
AC (DC POWER SUPPLY 1)
AC (Lamp regulator)
AC (DC POWER SUPPLY 2)
AC (DC POWER SUPPLY 3)
FU1
Thermal fuse
THSW1
Thermo switch
H1
Upper fixing heater
H2
Lower fixing heater
H3
Drum heater
SSR
DC power supply 1
Transfer push-on sheet release solenoid (CLC350 only)
M toner concentration sensor
C toner concentration sensor
Y toner concentration sensor
ATR 1
ATR 2
ATR 3
ATR (M)
ATR (C)
ATR (Y)
Color toner concentration adjustment PCB
Right DOOR switch 2
Right DOOR switch 1
SW2
SW3
Bk toner concentration sensor
ATR 4
ATR (BK)
Bk toner concentration adjustment PCB
C developing cylinder clutch
Bk developing cylinder clutch
M developing cylinder clutch
Y developing cylinder clutch
CL1
CL2
CL3
CL4
Primary corona wire cleaner motor
Laser/power supply cooling fan
FM6
M8
Left door switch
SW4
SW5
Pre-exposure lamp
LA2
Oil pump solenoid
SL15
Separation push-on solenoid
Separation toner brush solenoid
SL1
SL2
SL16
PS3
PS4
PS18
PS19
PS20
PS10
SL13
FM8
Separation claw solenoid
Feeder fan
Drum motor
M2
Laser scanner motor
M3
To image processor PCB
DC controller PCB
J301
J302
J303
J304
J305
J306
J307
J308
Upper cassette
Lower cassette
SW6
SW7
CL10
CL11
CL12
CL13
SL14
PS11
PS12
PS13
PS14
PS15
PS16
OHP sensor (pre-registration) sensor
Potential sensor
Potential measurement unit
Jumper connector (for counter mode)
J314
J316
J318
J320
J322
J323
J324
J325
J317
J315
J313
J312
J311
J310
J309
Developing assembly shift motor driver PCB
M4
Developing assembly shift motor
TH1
TH2
PS7
PS8
PS9
SL12
SL11
PS1
PS2
CL5
M6
M1
Main motor
SL10
SL9
SL8
M7
CL14
SL7
FM7
Offset tray
J741
FM3
FM2
FM5
FM4
TS4
TS3
TS2
TS1
CNT4
CNT3
CNT2
CNT1
FM9
CL9
CL8
CL7
CL6
Fixing roller surface temperature sensor
Delivery sensor
Cleaning belt level sensor
Oil level sensor
Oil application solenoid
Cleaning belt solenoid
Developing assembly cam TOP sensor
Developing assembly cam DOFF sensor
Developing assembly push-up clutch
Developing cylinder motor
Main motor
Transfer drum cleaner solenoid
Fixing speed change solenoid
Feeder speed change solenoid
Transfer drum cleaner motor
Registration roller clutch
Attraction solenoid
Fixing heat exhaust fan
Drum thermistor
Primary corona wire fan
Environment sensor
Developing assembly position sensor
Developing assembly shift base HP sensor
Toner suction fan
Ozone exhaust fan
Waste toner sensor
Scanner system cooling fan 2
Scanner system cooling fan 1
Bk toner level sensor
Y toner level sensor
C toner level sensor
M toner level sensor
Counter 4
Counter 3
Counter 2
Counter 1
Developing fan
Bk toner supply clutch
Y toner supply clutch
C toner supply clutch
M toner supply clutch

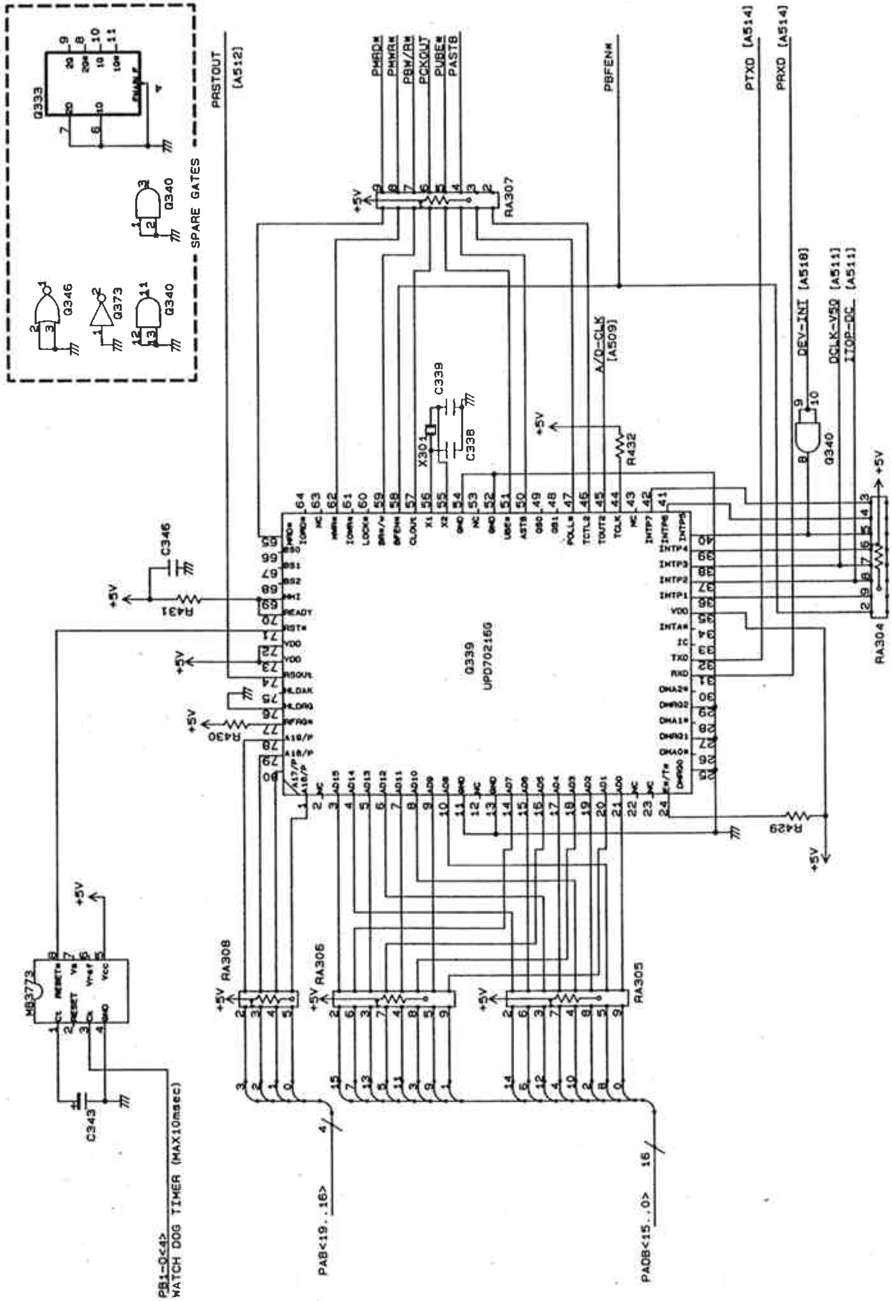
D. DC CONTROLLER CIRCUIT DIAGRAM

DC Controller Circuit Diagram (1/20; A501)


CPU
DC-A502
VDEC
DC-A503
BUS BUFFERS
DC-A504
ROM
DC-A505
RAM
DC-A506
I/O-E
DC-A507
I/O-O
DC-A508
J303
J304<A1-A6>
DC-A509
J304<A7-B14>
J305
DC-A510
J306 J307
DC-A511
J308 J325
DC-A512
J309
DC-A513
J310-J312
DC-A514
J313
DC-A515
J314
DC-A516
J315
DC-A517
J316 J317
J323 J324
DC-A518
J318-321 J326
DC-A519
J301 J302 J322
PASS CON
DC-A520

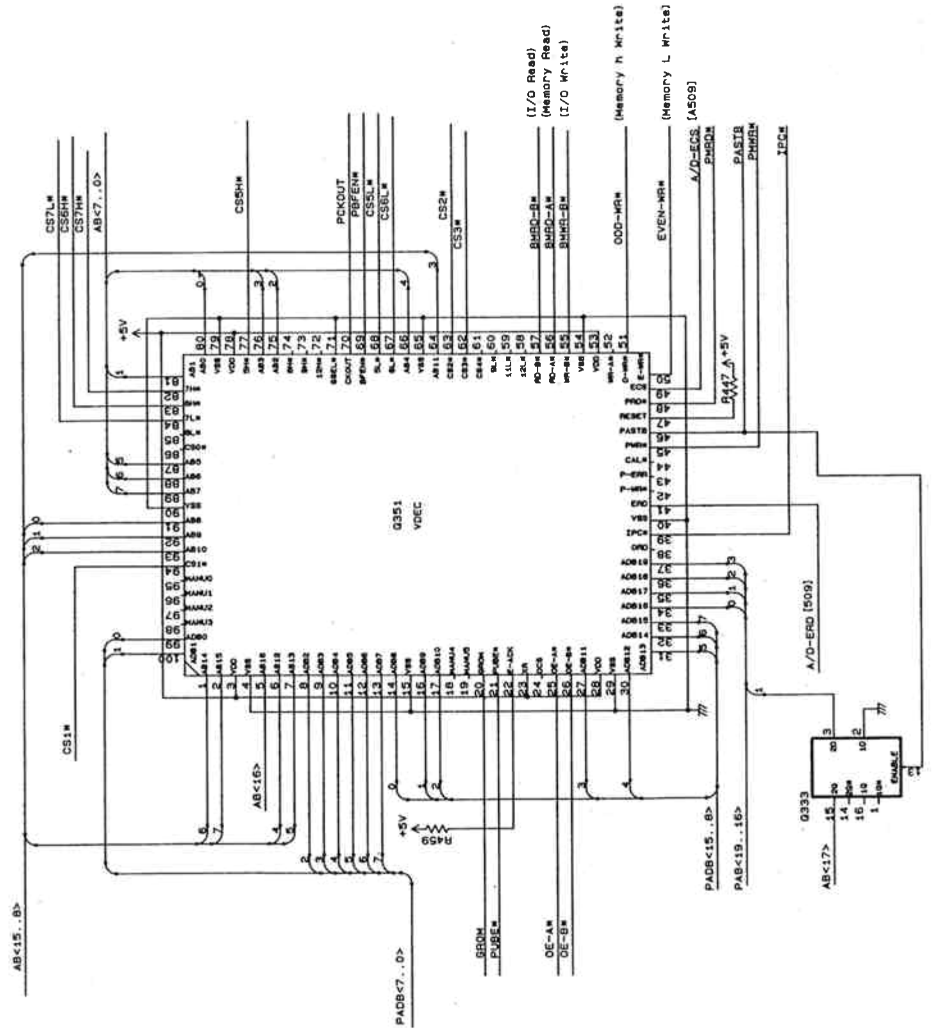
J-#	PAGE	DESCRIPTION
J301	A520	+5V +8V -8V +24VR 24VON
J302	A520	+24VU
J303	A509	ATR
J304	A509 A510	BK-PATCH SWS/WIRE-CLN/OIL-PUMP/COOLING-FAN/PRE-EXPS/EXHAUST-FAN
J305	A510	TRANSFER-DRUM/ADB-JAM/TNS-JAM/TDRUM-JAM
J306	A511	CONVEYER UNIT
J307	A511	DRUM MTR/POLYGON SCANNER
J308	A512	IMAGE PROCESSOR
J309	A513	HOPPERS/COUNTERS/DEVELOPER-FAN
J310	A514	SCANNER FAN/WASTE TONER
J311	A514	DEV-MOTOR DRIVER
J312	A514	SHIFTING TRAY
J313	A515	FUSER FAN/REGI-ROLLER/ADS-SOL/CONV-SPD/FUSER-SPD OUT-BRUSH/TRA-CLN/REAR-SW/MAIN-MTR
J314	A516	PAPER-FEED UNIT
J315	A517	SLEEVE MTR
J316	A518	DEVELOPER PUSH-UP
J317	A518	FUSER UNIT
J318	A519	AC HV UNIT
J319	A519	DC HV UNIT
J320	A519	POTENTIAL MEASUREMENT
J321	A519	POTENTIAL MEASUREMENT
J322	A520	DC CHECK
J323	A518	FACTORY
J324	A518	ACCOUNT
J325	A512	EXTRA IPC
J326	A519	HV CHECK

DC Controller Circuit Diagram (2/20; A502)

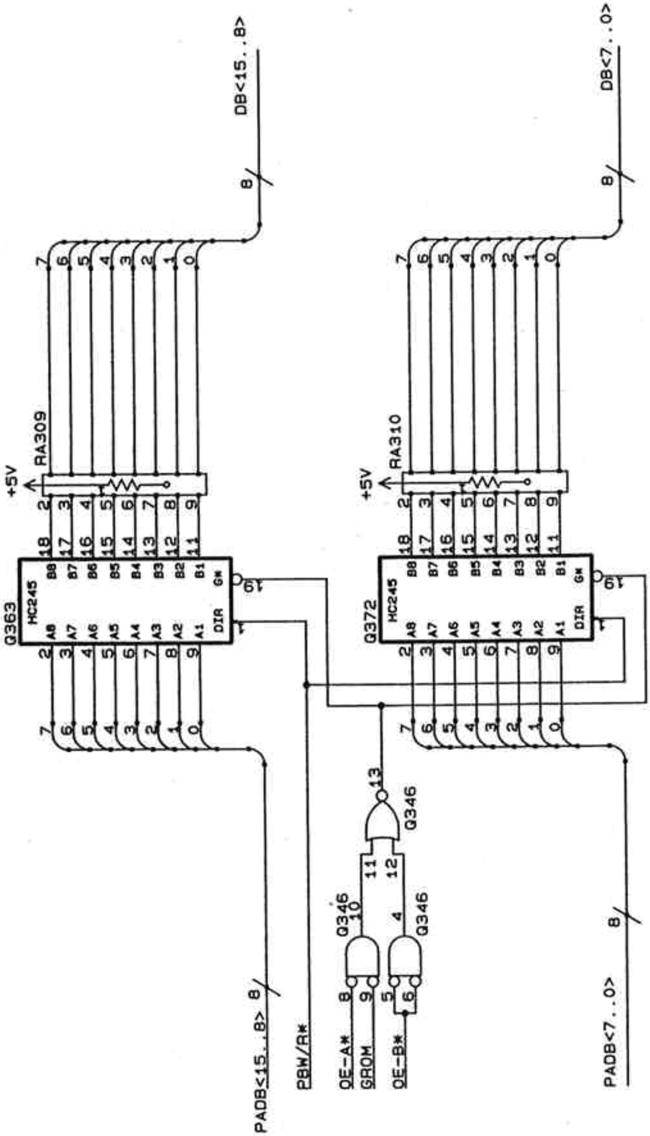


Q333
SPARE GATES
Q346
Q373
Q340
PRSTOUT [A512]
PMRD*
PMWR*
PBW/R*
PCKOUT
PUBE*
PASTB
RA307
+5V
PBFEN*
PTXD [A514]
PRXD [A514]
A/D-CLK [A509]
DEV-INT [A518]
DCLK-V50 [A511]
ITOP-DC [A511]
C339
C338
X301
R432
C346
R431
R430
R429
Q339
UPD70216G
RA304
RA308
RA306
RA305
M53773
C343
PB1-0<4>
WATCH DOG TIMER (MAX10msec)
PAB<19..16>
PADB<15..0>
4
16

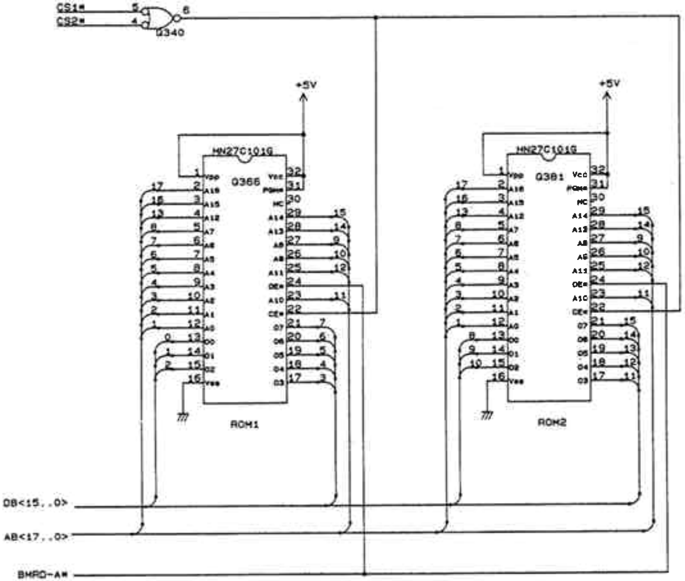
DC Controller Circuit Diagram (3/20; A503)


CS7L*
CS6H*
CS7H*
AB<7..0>
CS5H*
PCKOUT
PBFEN*
CS5L*
CS6L*
CS2*
CS3*
(I/O Read)
(Memory Read)
(I/O Write)
BWRD-B*
BWRD-A*
BWWR-B*
(Memory H Write)
ODD-WR*
(Memory L Write)
EVEN-WR*
[A509]
A/D-ECS
PWRD*
PASTB
PWWR*
IPC*
+5V
Q351
VDEC
R447
A/D-ERD [509]
Q333
ENABLE
AB<17>
PADB<15..8>
PAB<19..16>
R459
GROM
PUBE*
OE-A*
OE-B*
AB<16>
CS1*
AB<15..8>
PADB<7..0>

DC Controller Circuit Diagram (4/20; A504)


DB<15..8>
DB<7..0>
8
RA309
RA310
+5V
Q363
Q372
HC245
A1 A2 A3 A4 A5 A6 A7 A8
B1 B2 B3 B4 B5 B6 B7 B8
DIR
G*
19
Q346
PADB<15..8>
PADB<7..0>
PBW/R*
OE-A*
GROM
OE-B*

DC Controller Circuit Diagram (5/20; A505)


CS1*
CS2*
Q340
+5V
HN27C101G
Q366
Q381
Vpp
A16
A15
A12
A7
A6
A5
A4
A3
A2
A1
A0
O0
O1
O2
Vss
Vcc
PGM*
NC
A14
A13
A8
A9
A11
OE*
A10
CE*
O7
O6
O5
O4
O3
ROM1
ROM2
DB<15..0>
AB<17..0>
BMRD-A*

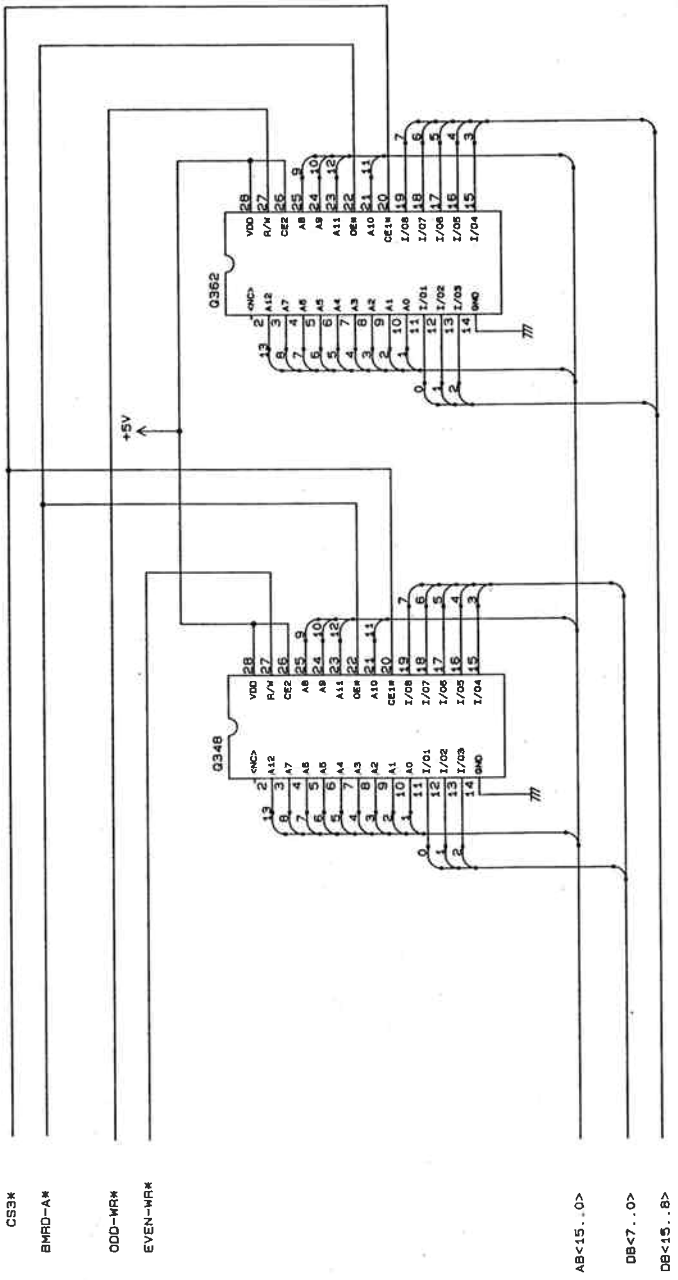
MEMORY MAPPING

00000	Thru	1FFFF	CS1	ROM1+ ROM2	128K +128K
20000	Thru	3FFFF	CS2		
40000	Thru	43FFF	CS3	RAM	16K
50000	Thru	50FFF	CS4		

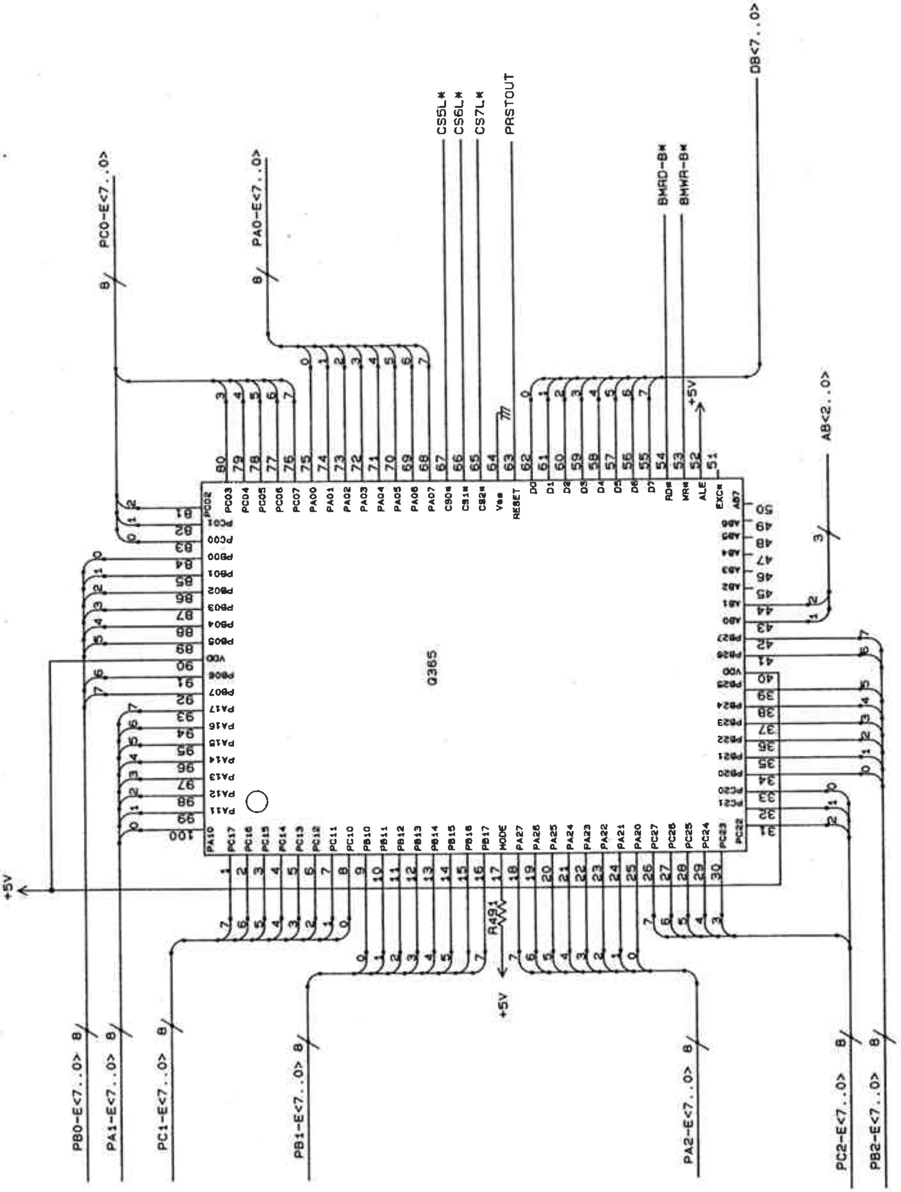
MEMORY MAPPED I/O

60000	CS5H CS5L	8255 8255
61000	CS6H CS6L	8255 8255
62000	CS7H CS7L	8255 8255
63000	CS8H CS8L	
64000	CS9H CS9L	
65000	CS10H CS10L	A/D CONVERTER
66000	CS11H CS11L	
67000	CS12H CS12L	
80000	CAL	
81000	IPC	IPC

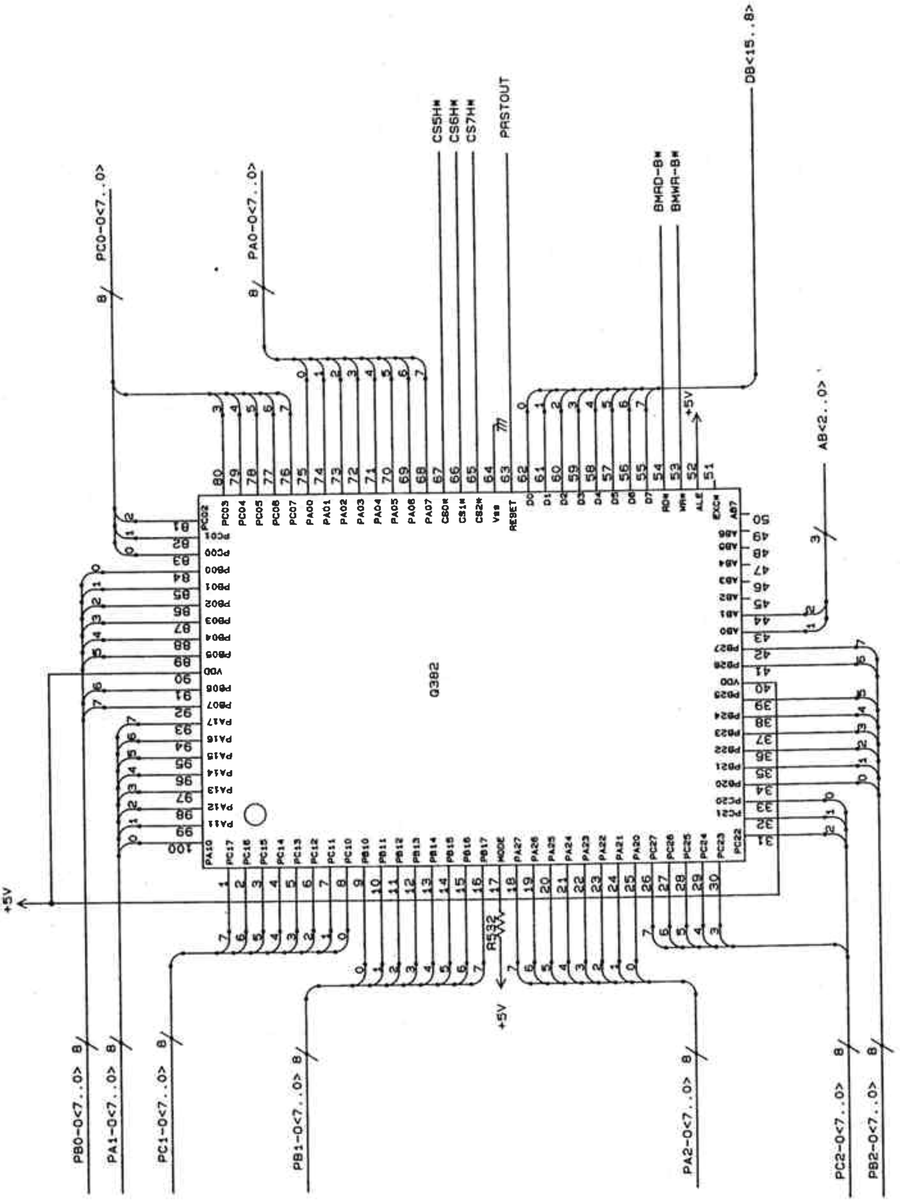
DC Controller Circuit Diagram (6/20; A506)


Q362
Q348
VDD
R/W
CE2
A8
A9
A11
OE*
A10
CE1*
I/O8
I/O7
I/O6
I/O5
I/O4
<NC>
A12
A7
A6
A5
A4
A3
A2
A1
A0
I/O1
I/O2
I/O3
GND
+5V
CS3*
BMRD-A*
ODD-WR*
EVEN-WR*
AB<15..0>
DB<7..0>
DB<15..8>

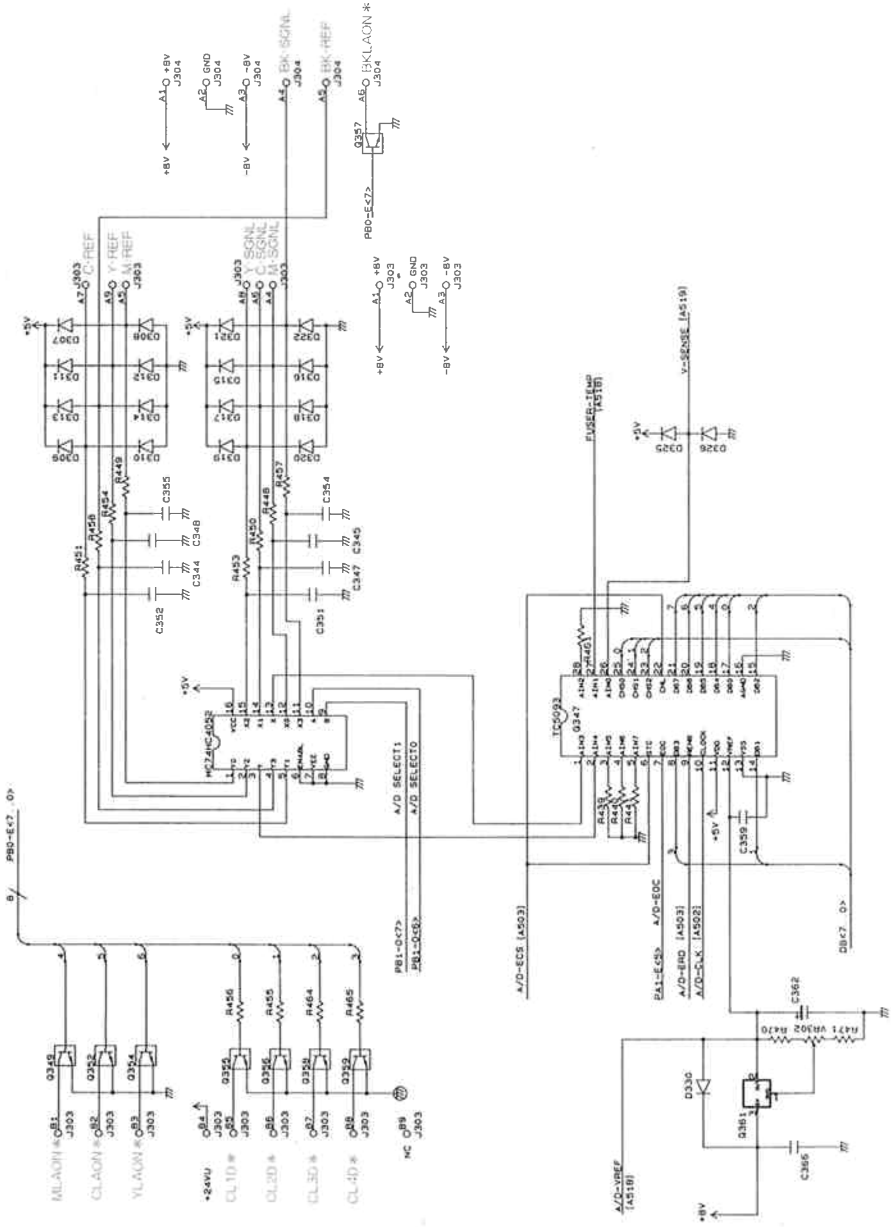
DC Controller Circuit Diagram (7/20; A507)


PC0-E<7..0>
PA0-E<7..0>
CS5L*
CS6L*
CS7L*
PRSTOUT
DB<7..0>
BMRD-B*
BMWR-B*
+5V
AB<2..0>
Q365
R491
PB0-E<7..0>
PA1-E<7..0>
PC1-E<7..0>
PB1-E<7..0>
PA2-E<7..0>
PC2-E<7..0>
PB2-E<7..0>
8
3
RESET
MODE
ALE
EXC*
VDD
Vss

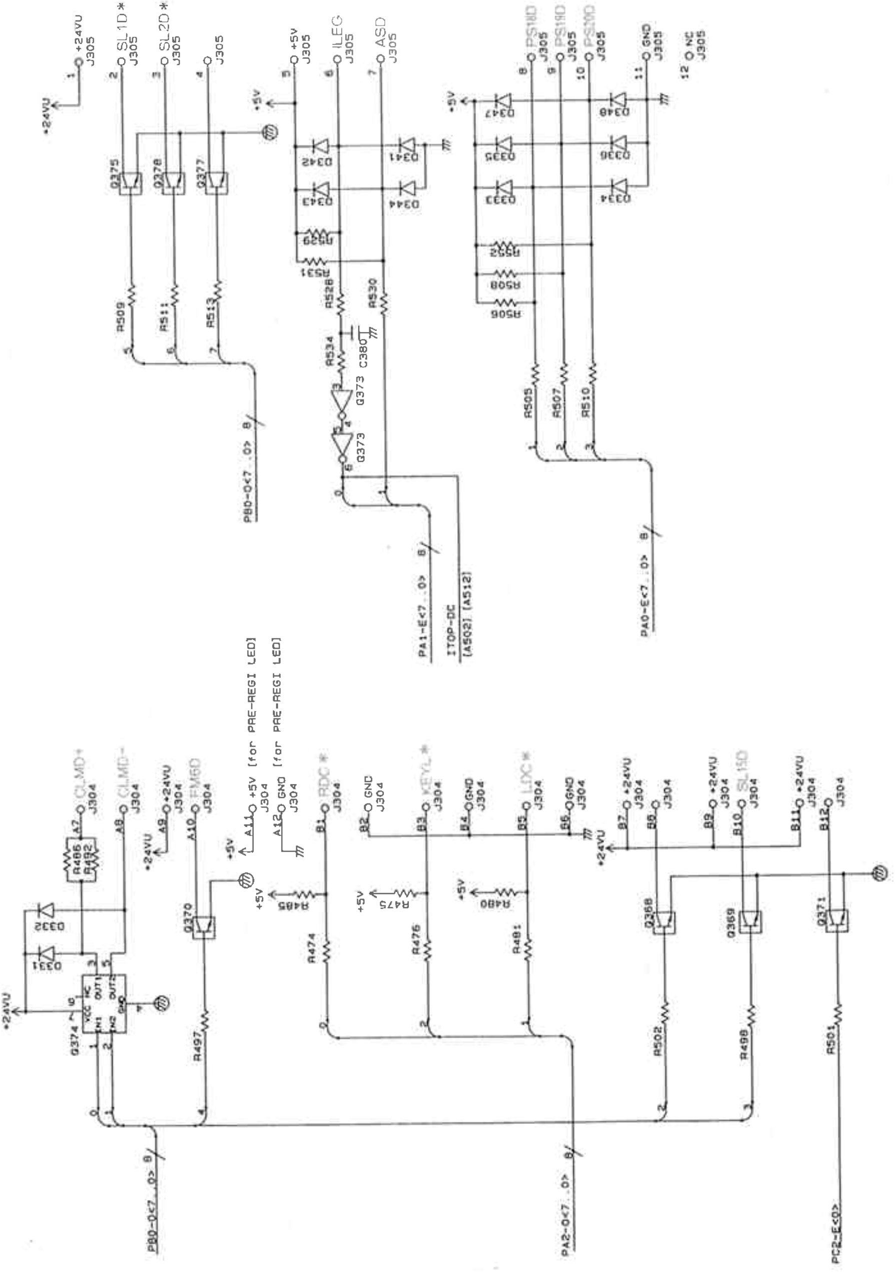
DC Controller Circuit Diagram (8/20; A508)


PC0-O<7..0>
PA0-O<7..0>
CS5H*
CS6H*
CS7H*
PRSTOUT
BMRD-B*
BMWR-B*
DB<15..8>
AB<2..0>
+5V
Q382
R532
PB0-O<7..0>
PA1-O<7..0>
PC1-O<7..0>
PB1-O<7..0>
PA2-O<7..0>
PC2-O<7..0>
PB2-O<7..0>

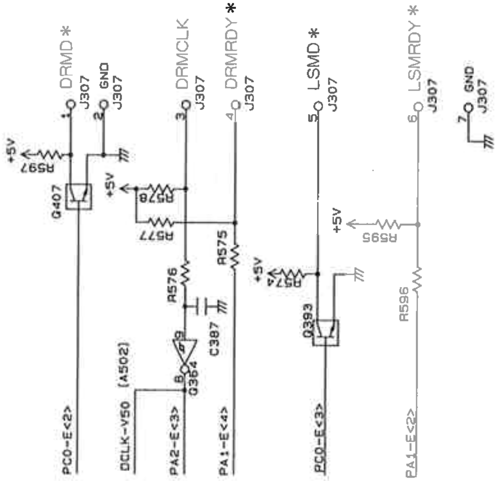
DC Controller Circuit Diagram (9/20; A509)

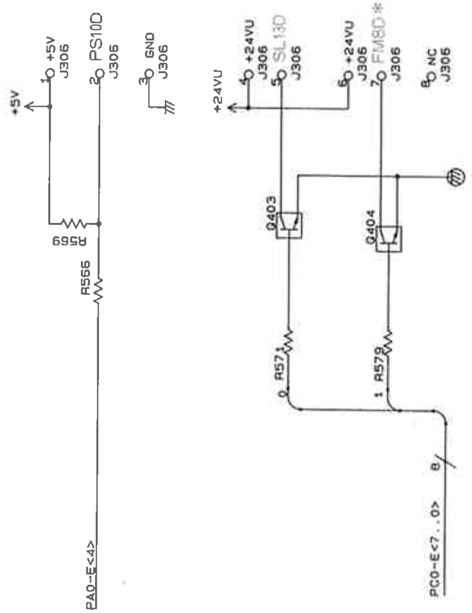

+8V
A1 J304 +8V
A2 J304 GND
-8V
A3 J304 -8V
A4 J304 BK-SGNL
A5 J304 BK-REF
A6 J304 BKLAON＊
Q357
PB0-E<7>
A7 J303 C-REF
A9 J303 Y-REF
A5 J303 M-REF
A8 J303 Y-SGNL
A6 J303 C-SGNL
A4 J303 M-SGNL
A1 J303 +8V
A2 J303 GND
A3 J303 -8V
+5V
D307
D308
D309
D310
D311
D312
D313
D314
D315
D316
D317
D318
D319
D320
D321
D322
R449
R451
R454
R458
R448
R450
R453
R457
C344
C345
C347
C348
C351
C352
C354
C355
HC74HC4052
A/D SELECT1
A/D SELECT0
PB1-O<7>
PB1-O<6>
FUSER-TEMP [A518]
V-SENSE [A519]
D325
D326
TC5093
Q347
R446
R439
R440
R441
C359
A/D-ECS [A503]
A/D-EOC
PA1-E<5>
A/D-ERD [A503]
A/D-CLK [A502]
DB<7..0>
C362
R470
VR302
R471
D330
Q361
C366
A/D-VREF [A518]
PB0-E<7..0>
8
MLAON＊ B1 J303
CLAON＊ B2 J303
YLAON＊ B3 J303
Q349
Q352
Q354
+24VU B4 J303
CL1D＊ B5 J303
CL2D＊ B6 J303
CL3D＊ B7 J303
CL4D＊ B8 J303
NC B9 J303
R456
R455
R464
R465
Q355
Q356
Q358
Q359

DC Controller Circuit Diagram (10/20; A510)

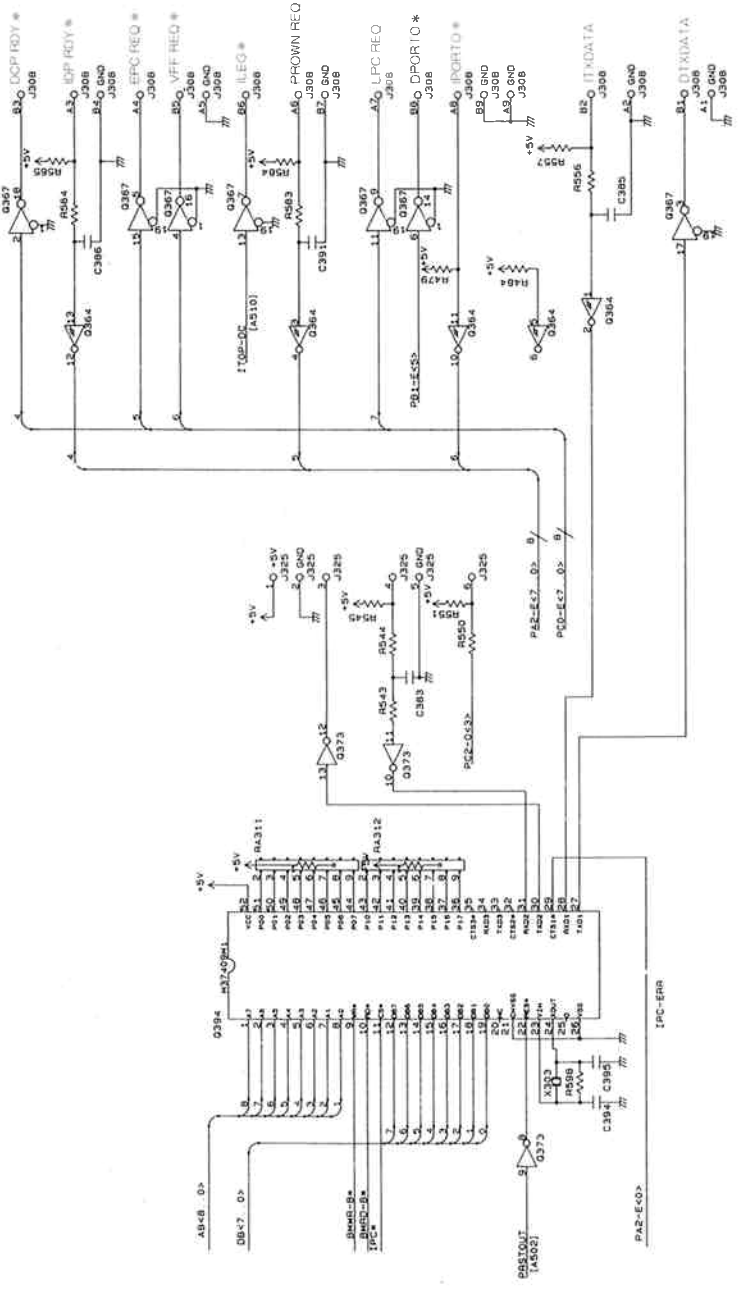

+24VU
J305
SL1D*
SL2D*
+5V
ILEG
ASD
PS18D
PS11D
PS1MD
GND
NC
Q375
Q376
Q377
R509
R511
R513
PB0-O<7..0>
8
D342
D341
D343
D344
R529
R531
R528
R530
R534
C380
Q373
PA1-E<7..0>
ITOP-DC
[A502] [A512]
D347
D348
D335
D336
D333
D334
R552
R508
R506
R505
R507
R510
PA0-E<7..0>
CLMD+
CLMD-
J304
FMGD
+5V [for PRE-REGI LED]
GND [for PRE-REGI LED]
RDC*
KEYL*
LDC*
SL1SD
Q374
D332
D331
R486
R492
Q370
R497
R485
R474
R475
R476
R480
R481
Q368
Q369
Q371
R502
R498
R501
PB0-O<7..0>
PA2-O<7..0>
PC2-E<0>

DC Controller Circuit Diagram (11/20; A511)

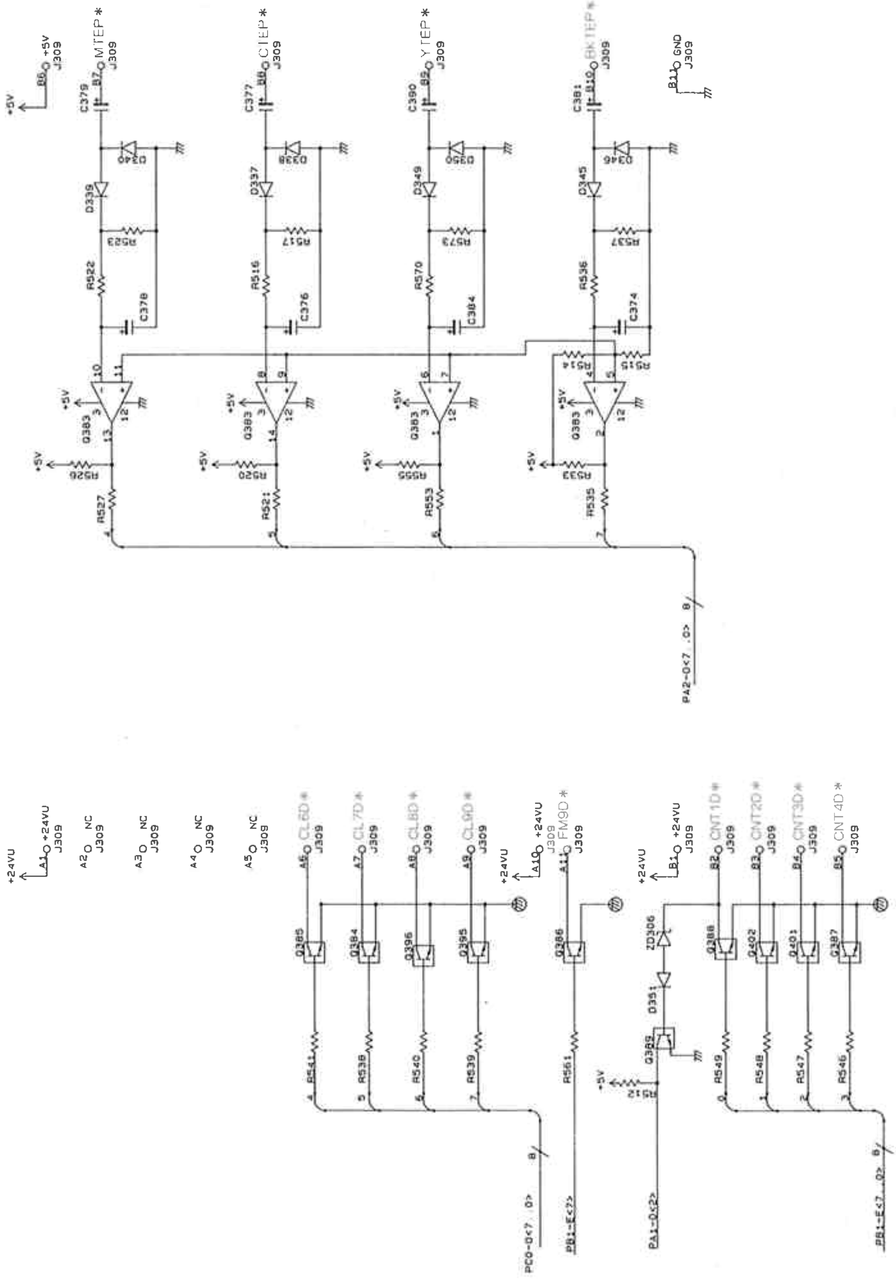

DRMD *
J307
GND
DRMCLK
DRMRDY *
LSMD *
LSMRDY *
+5V
R597
Q407
R578
R577
R575
R576
C387
Q364
(A502)
DCLK-V50
PC0-E<2>
PA2-E<3>
PA1-E<4>
R574
Q393
R595
R596
PC0-E<3>
PA1-E<2>


+5V
J306
PS10D
GND
R569
R566
PA0-E<4>
+24VU
SL13D
FM8D *
NC
Q403
Q404
R571
R579
8
PC0-E<7..0>

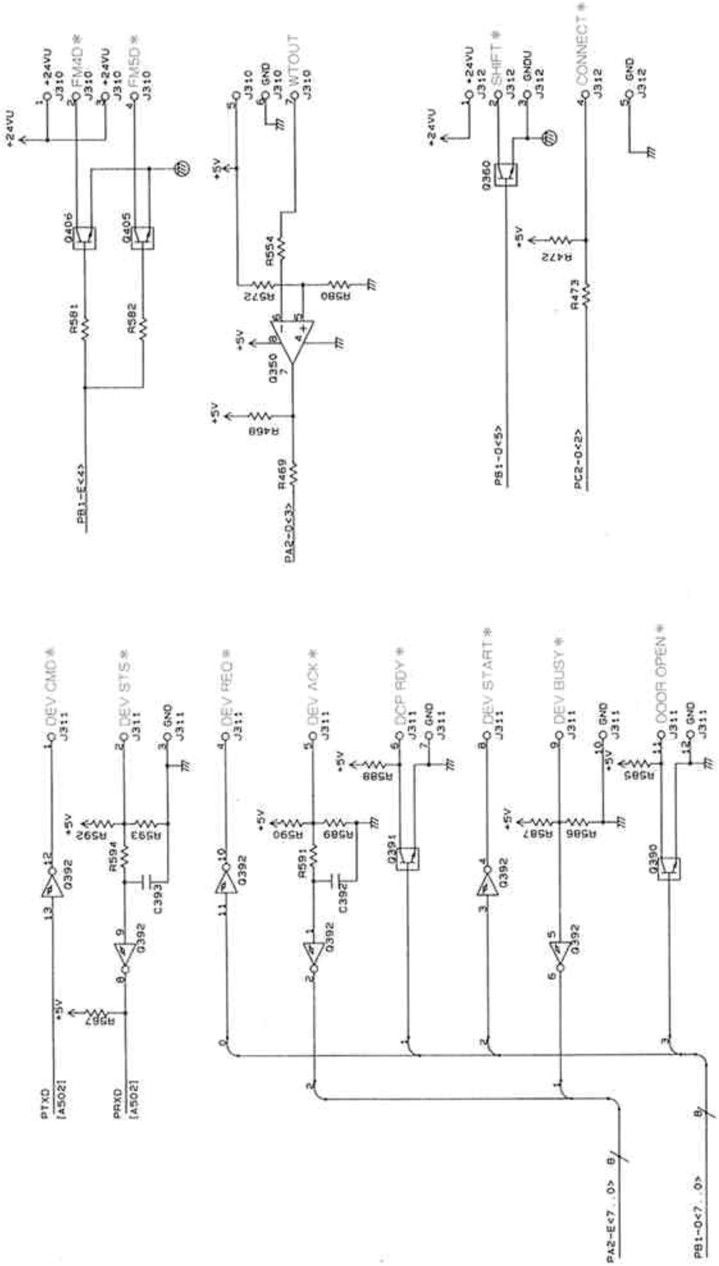
DC Controller Circuit Diagram (12/20; A512)


DCP RDY *
IDP RDY *
EPC REQ *
VFF REQ *
ILEG *
PROWN REQ
LPC REQ
DPORTO *
IPORTO *
ITXDATA
DTXDATA
J308
GND
+5V
Q367
Q364
Q373
Q394
M37409M1
R565
R564
R584
R583
R479
R484
R557
R556
R545
R544
R543
R551
R550
R598
C386
C391
C385
C383
C394
C395
X303
RA311
RA312
J325
ITOP-DC
[A510]
PB1-E<5>
PA2-E<7..0>
PC0-E<7..0>
PC2-D<3>
AB<8..0>
DB<7..0>
BWWR-B*
BWRD-B*
IPC*
PRSTOUT
[A502]
IPC-ERR
PA2-E<0>

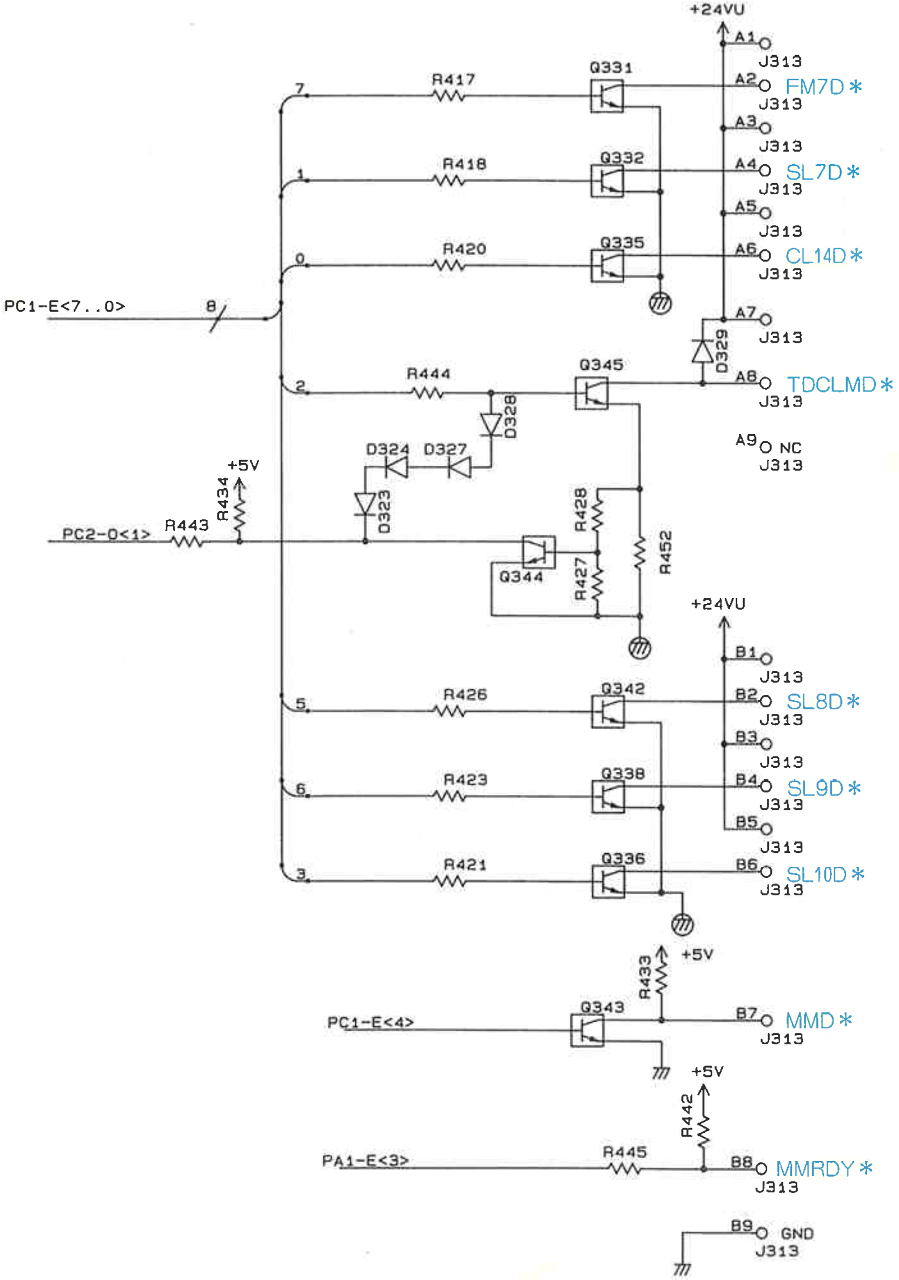
DC Controller Circuit Diagram (13/20; A513)


+5V
B6 +5V J309
B7 MTEP* J309
B8 CTEP* J309
B9 YTEP* J309
B10 BKTEP* J309
B11 GND J309
C379
C377
C390
C381
D339
D340
D337
D338
D349
D350
D345
D346
R522
R523
R516
R517
R570
R573
R536
R537
C378
C376
C384
C374
R514
R515
Q383
R526
R520
R555
R533
R527
R521
R553
R535
PA2-O<7..0> 8
+24VU
A1 +24VU J309
A2 NC J309
A3 NC J309
A4 NC J309
A5 NC J309
A6 CL6D* J309
A7 CL7D* J309
A8 CL8D* J309
A9 CL9D* J309
A10 +24VU J309
A11 FM9D* J309
B1 +24VU J309
B2 CNT1D* J309
B3 CNT2D* J309
B4 CNT3D* J309
B5 CNT4D* J309
Q385
Q384
Q396
Q395
Q386
ZD306
D351
Q389
R512
Q388
Q402
Q401
Q387
R541
R538
R540
R539
R561
R549
R548
R547
R546
PC0-O<7..0> 8
PB1-E<7>
PA1-O<2>
PB1-E<7..0> 8

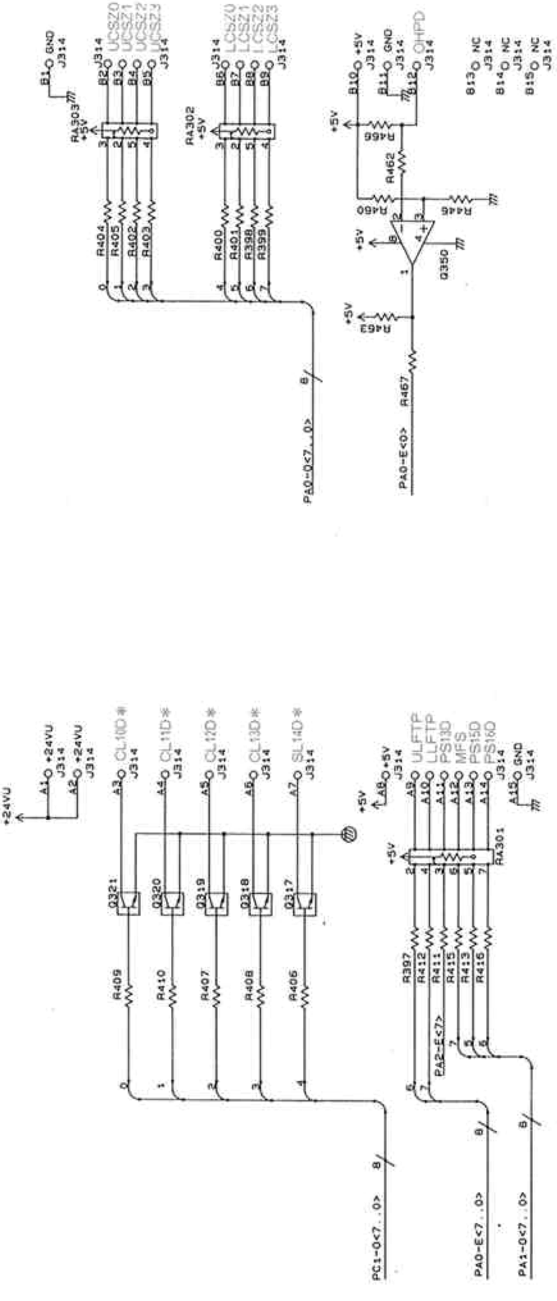
DC Controller Circuit Diagram (14/20; A514)


+24VU
J310
FM4D*
FM5D*
Q406
Q405
R581
R582
PB1-E<4>
+5V
GND
WTOUT
R554
R572
R580
Q350
R468
R469
PA2-O<3>
J312
SHIFT*
GNDU
CONNECT*
Q360
R472
R473
PB1-O<5>
PC2-O<2>
J311
DEV CMD*
DEV STS*
DEV REQ*
DEV ACK*
DCP RDY*
DEV START*
DEV BUSY*
DOOR OPEN*
Q392
R594
R592
R593
C393
R590
R589
R591
C392
R588
Q391
R587
R586
R585
Q390
R567
PTXD [A502]
PRXD [A502]
PA2-E<7..0>
PB1-O<7..0>
8

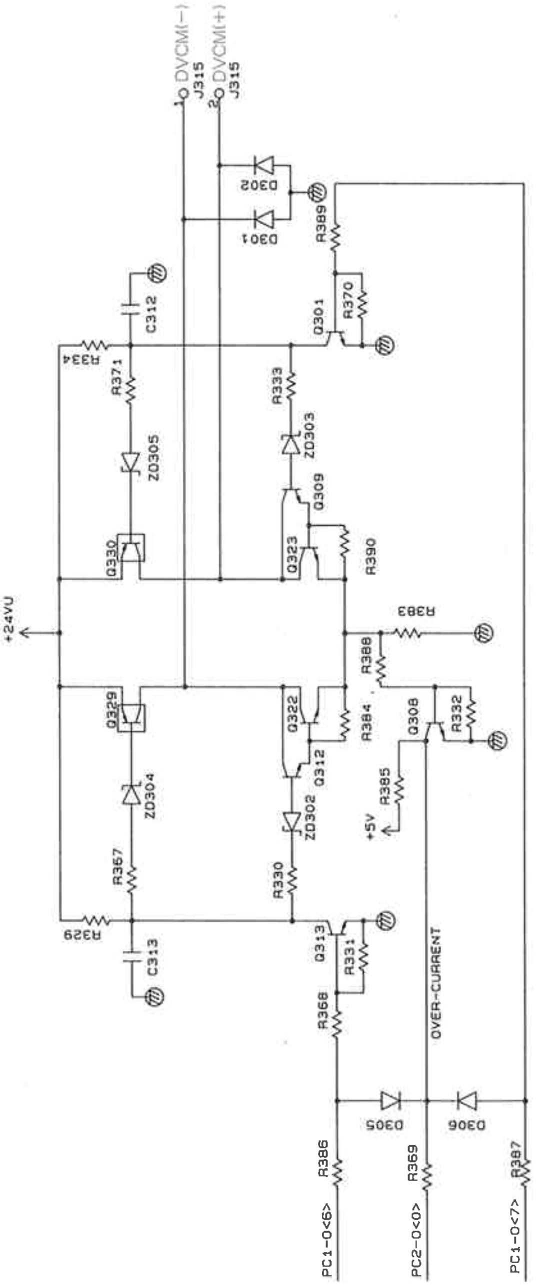
DC Controller Circuit Diagram (15/20; A515)


+24VU
A1
J313
Q331
R417
7
A2
FM7D *
J313
A3
J313
Q332
R418
1
A4
SL7D *
J313
A5
J313
Q335
R420
0
A6
CL14D *
J313
PC1-E<7..0>
8
A7
J313
D329
Q345
R444
2
A8
TDCLMD *
J313
D328
A9
NC
J313
D324
D327
+5V
R434
D323
R428
PC2-O<1>
R443
R452
Q344
R427
+24VU
B1
J313
Q342
R426
5
B2
SL8D *
J313
B3
J313
Q338
R423
6
B4
SL9D *
J313
B5
J313
Q336
R421
3
B6
SL10D *
J313
+5V
R433
Q343
PC1-E<4>
B7
MMD *
J313
+5V
R442
PA1-E<3>
R445
B8
MMRDY *
J313
B9
GND
J313

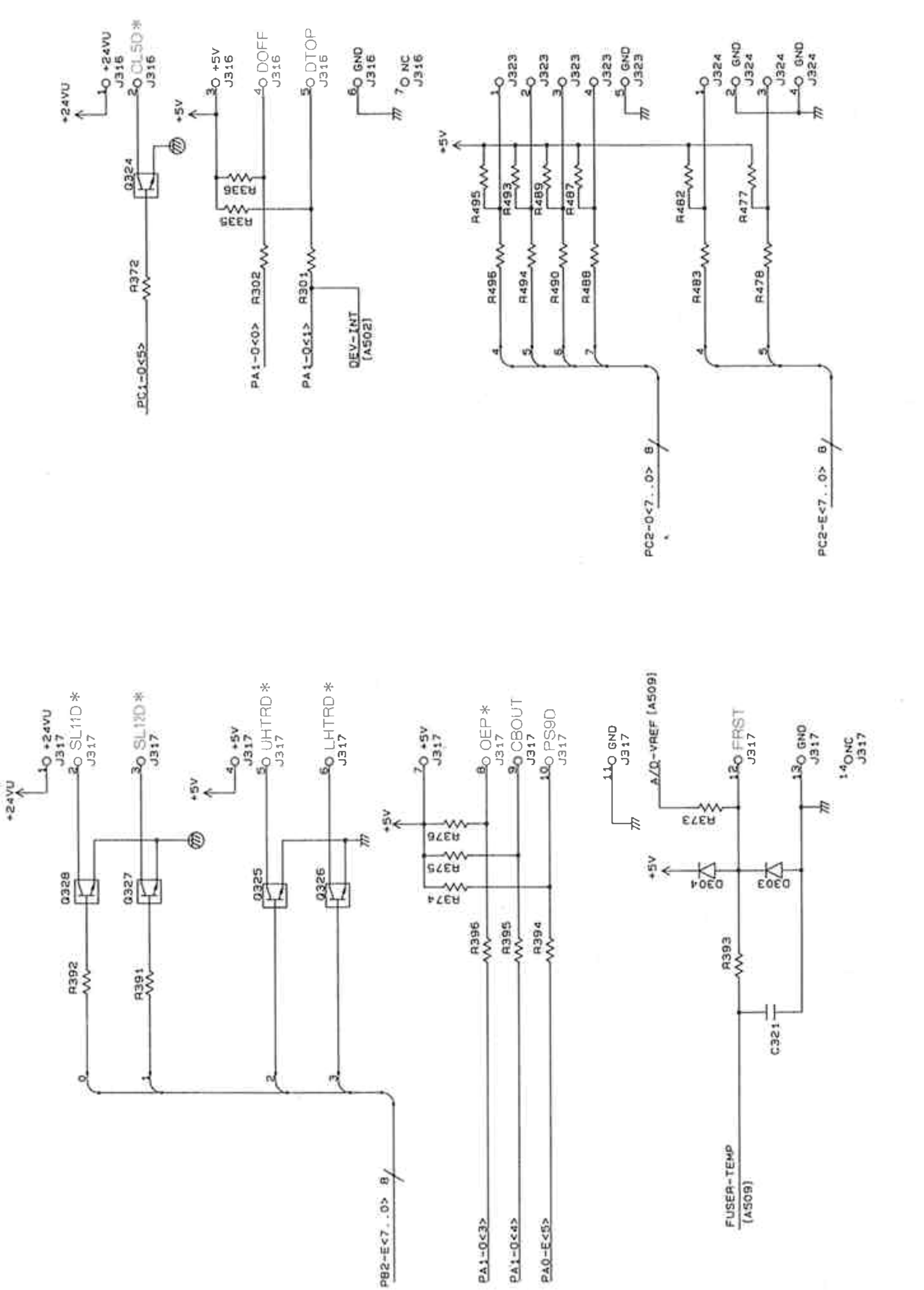
DC Controller Circuit Diagram (16/20; A516)


B1 GND J314
RA303
+5V
B2 UCSZ0 J314
B3 UCSZ1
B4 UCSZ2
B5 UCSZ3 J314
R404
R405
R402
R403
RA302
B6 LCSZ0 J314
B7 LCSZ1
B8 LCSZ2
B9 LCSZ3 J314
R400
R401
R398
R399
PA0-O<7..0>
8
B10 +5V J314
B11 GND J314
B12 OHPD J314
B13 NC J314
B14 NC J314
B15 NC J314
R466
R462
R460
R446
Q350
R463
R467
PA0-E<0>
+24VU
A1 +24VU J314
A2 +24VU J314
A3 CL10D* J314
A4 CL11D* J314
A5 CL12D* J314
A6 CL13D* J314
A7 SL14D* J314
Q321
Q320
Q319
Q318
Q317
R409
R410
R407
R408
R406
PC1-O<7..0>
A8 +5V J314
A9 ULFTP
A10 LLFTP
A11 PS13D
A12 MFS
A13 PS15D
A14 PS16D J314
A15 GND J314
RA301
R397
R412
R411
R415
R413
R416
PA2-E<7>
PA0-E<7..0>
PA1-O<7..0>

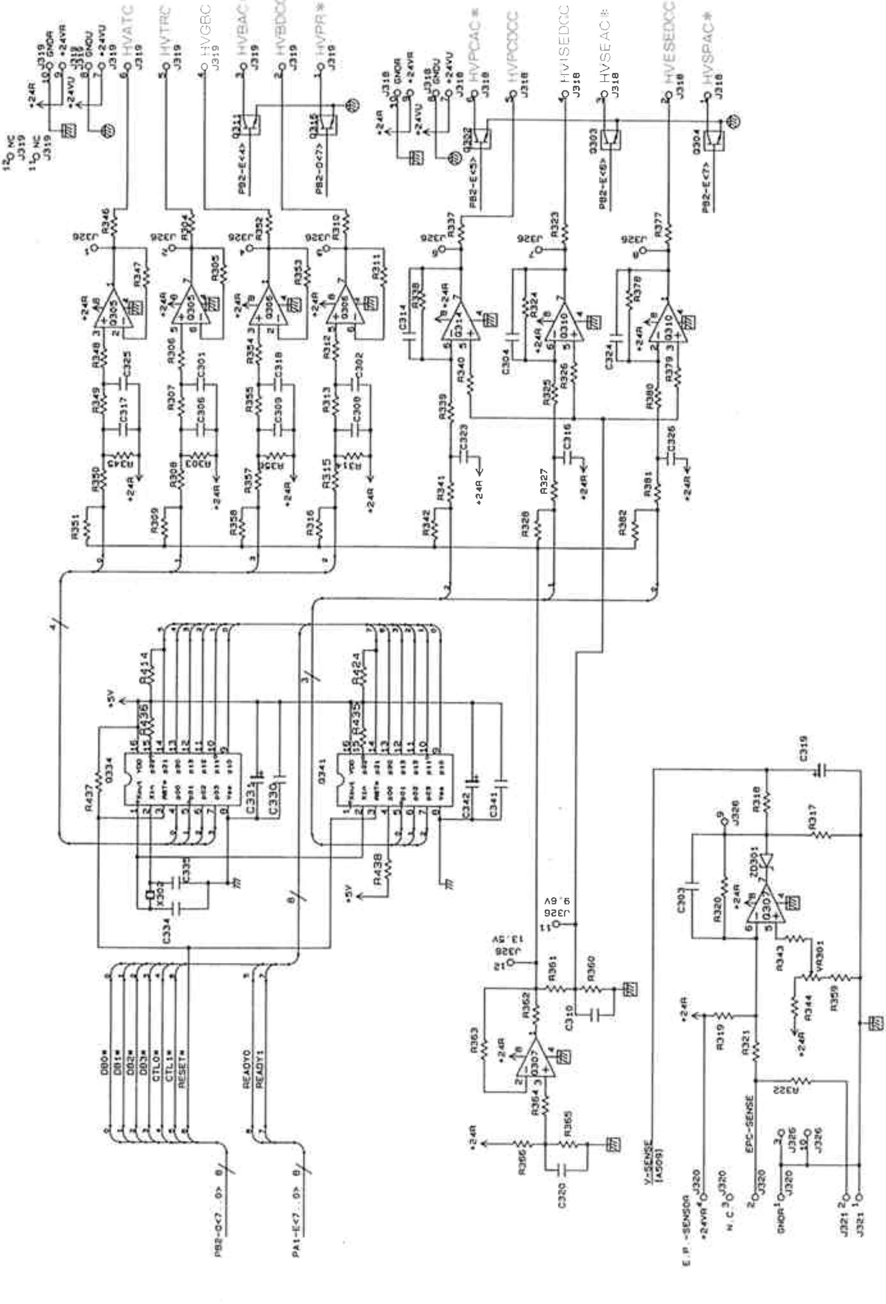
DC Controller Circuit Diagram (17/20; A517)


1
DVCM(−)
J315
2
DVCM(+)
J315
D301
D302
R389
R370
Q301
C312
R334
R371
ZD305
R333
ZD303
Q309
Q330
Q323
R390
+24VU
R383
R388
Q329
Q322
R384
Q308
R332
Q312
ZD304
R385
+5V
ZD302
R367
R330
R329
C313
Q313
R331
R368
OVER-CURRENT
D305
D306
R386
R369
R387
PC1-O<6>
PC2-O<0>
PC1-O<7>

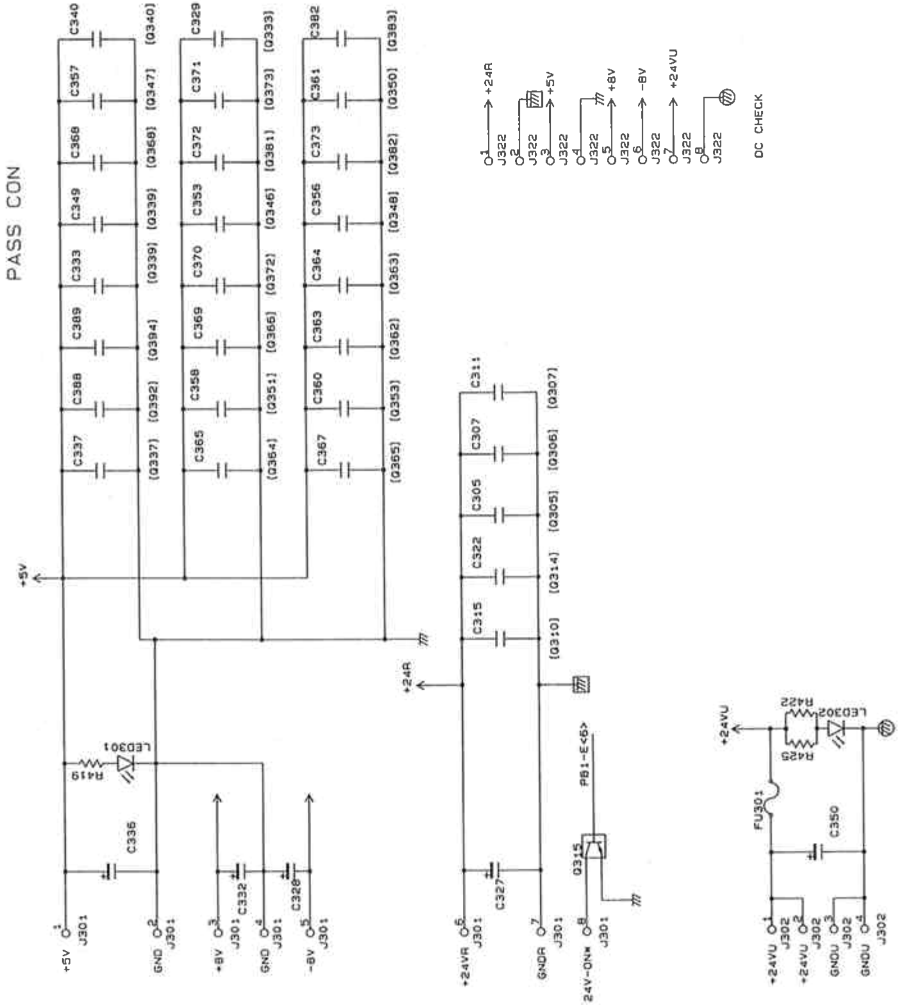
DC Controller Circuit Diagram (18/20; A518)


+24VU
1 +24VU J316
2 CLSD* J316
3 +5V J316
4 DOFF J316
5 DTOP J316
6 GND J316
7 NC J316
+5V
Q324
R372
R336
R335
R302
R301
PC1-O<5>
PA1-O<0>
PA1-O<1>
DEV-INT (A502)
1 J323
2 J323
3 J323
4 J323
5 GND J323
1 J324
2 GND J324
3 J324
4 GND J324
R495
R493
R489
R487
R482
R477
R496
R494
R490
R488
R483
R478
PC2-O<7..0> 8
PC2-E<7..0> 8
1 +24VU J317
2 SL11D* J317
3 SL12D* J317
4 +5V J317
5 UHTRD* J317
6 LHTRD* J317
7 +5V J317
8 OEP* J317
9 CBOUT J317
10 PS9D J317
11 GND J317
12 FRST J317
13 GND J317
14 NC J317
A/D-VREF (A509)
Q328
Q327
Q325
Q326
R392
R391
R376
R375
R374
R396
R395
R394
R373
D304
D303
R393
C321
PB2-E<7..0> 8
PA1-O<3>
PA1-O<4>
PA0-E<5>
FUSER-TEMP (A509)

DC Controller Circuit Diagram (19/20; A519)

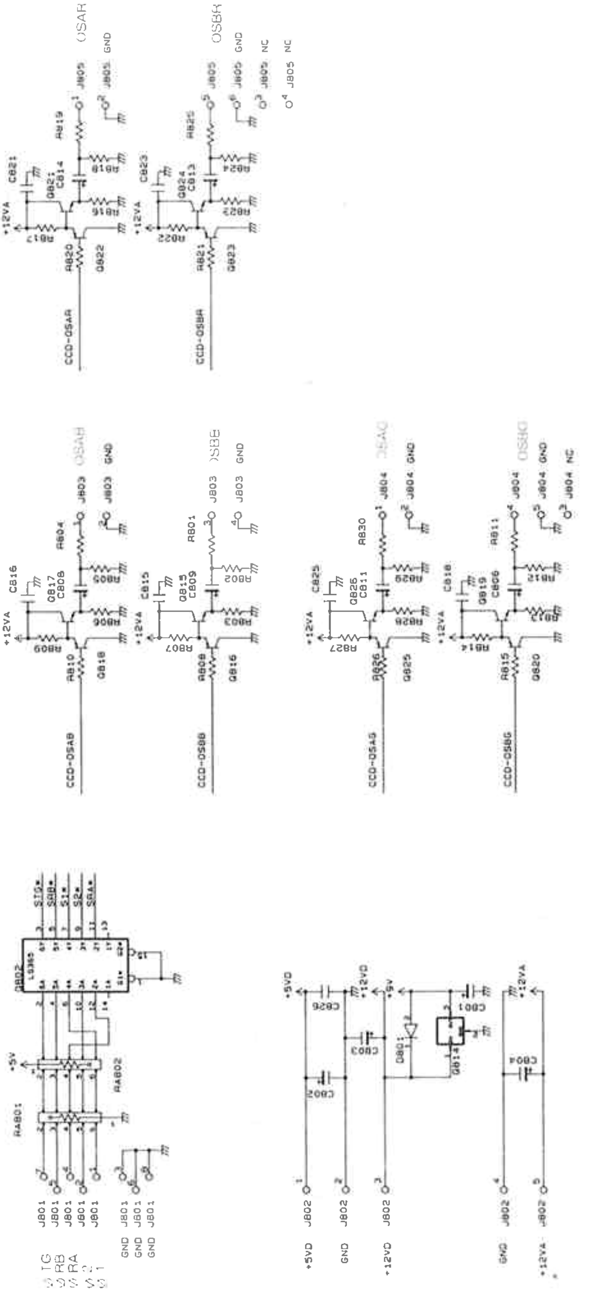

HVATC
HVTRC
HVGBC
HVBAC*
HVBDCC
HVPR*
HVPCAC*
HVPCDCC
HVISEDCC
HVSEAC*
HVESEDCC
HVSPAC*
J319
J318
J326
J320
J321
+24R
+24VR
+24VU
+24V
GNDR
GNDU
NC
+5V
Q305
Q306
Q307
Q310
Q311
Q312
Q315
Q302
Q303
Q304
Q334
Q341
ZD301
VR301
X302
PB2-E<4>
PB2-D<7>
PB2-E<5>
PB2-E<6>
PB2-E<7>
DB0*
DB1*
DB2*
DB3*
CTL0*
CTL1*
RESET*
READY0
READY1
PB2-D<7..0>
PA1-E<7..0>
13.5V
9.6V
V-SENSE
[A509]
E.P.-SENSOR
EPC-SENSE
N.C

DC Controller Circuit Diagram (20/20; A520)

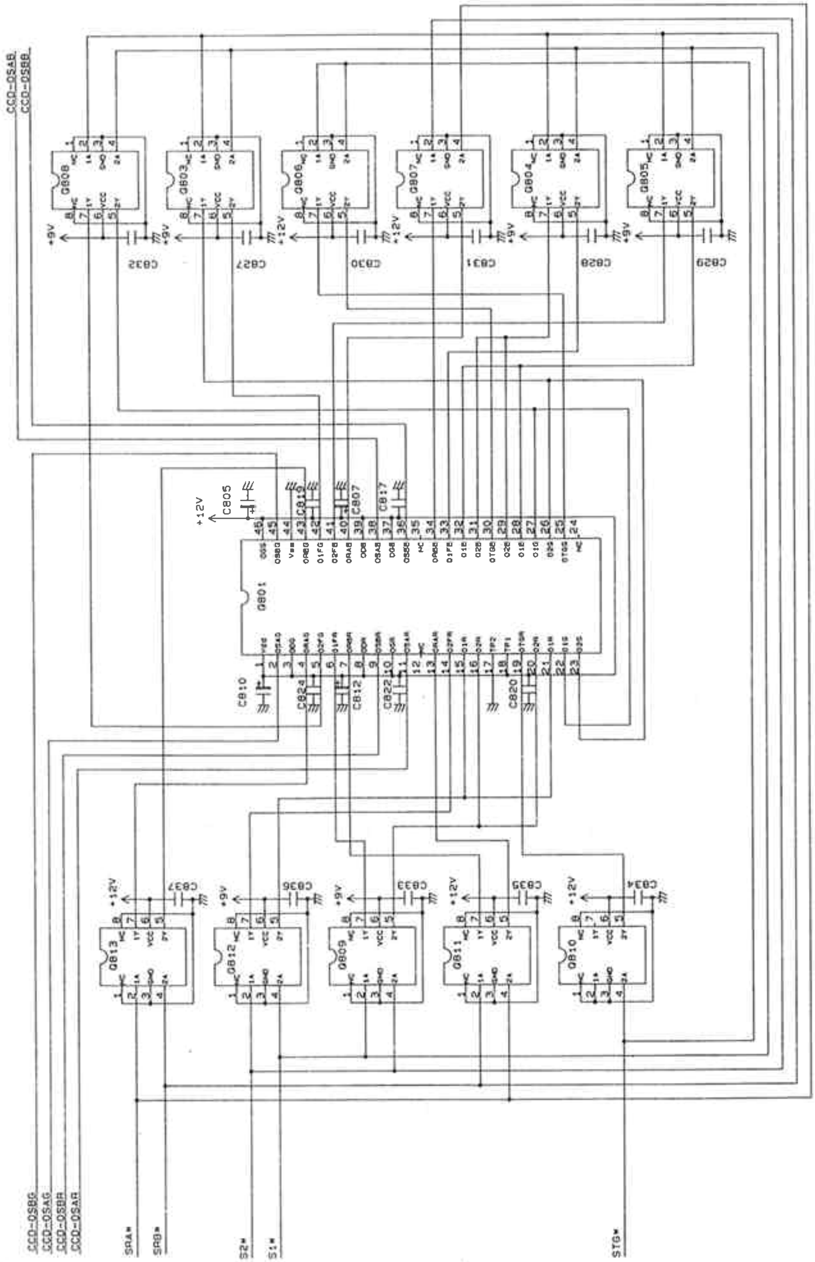

PASS CON
C340
C357
C368
C349
C333
C389
C388
C337
(Q340)
(Q347)
(Q368)
(Q339)
(Q339)
(Q394)
(Q392)
(Q337)
C329
C371
C372
C353
C370
C369
C358
C365
(Q333)
(Q373)
(Q381)
(Q346)
(Q372)
(Q366)
(Q351)
(Q364)
C382
C361
C373
C356
C364
C363
C360
C367
(Q383)
(Q350)
(Q382)
(Q348)
(Q363)
(Q362)
(Q353)
(Q365)
+5V
C311
C307
C305
C322
C315
(Q307)
(Q306)
(Q305)
(Q314)
(Q310)
+24R
R419
LED301
C336
C332
C328
+5V
J301
GND
+8V
-8V
+24VR
GNDR
24V-ON*
C327
Q315
PB1-E<6>
J322
+24R
+5V
+8V
-8V
+24VU
DC CHECK
+24VU
R422
R425
LED302
FU301
C350
J302
+24VU
GNDU

E. CCD DRIVER CIRCUIT DIAGRAM

CCD Driver Circuit Diagram (1/2)

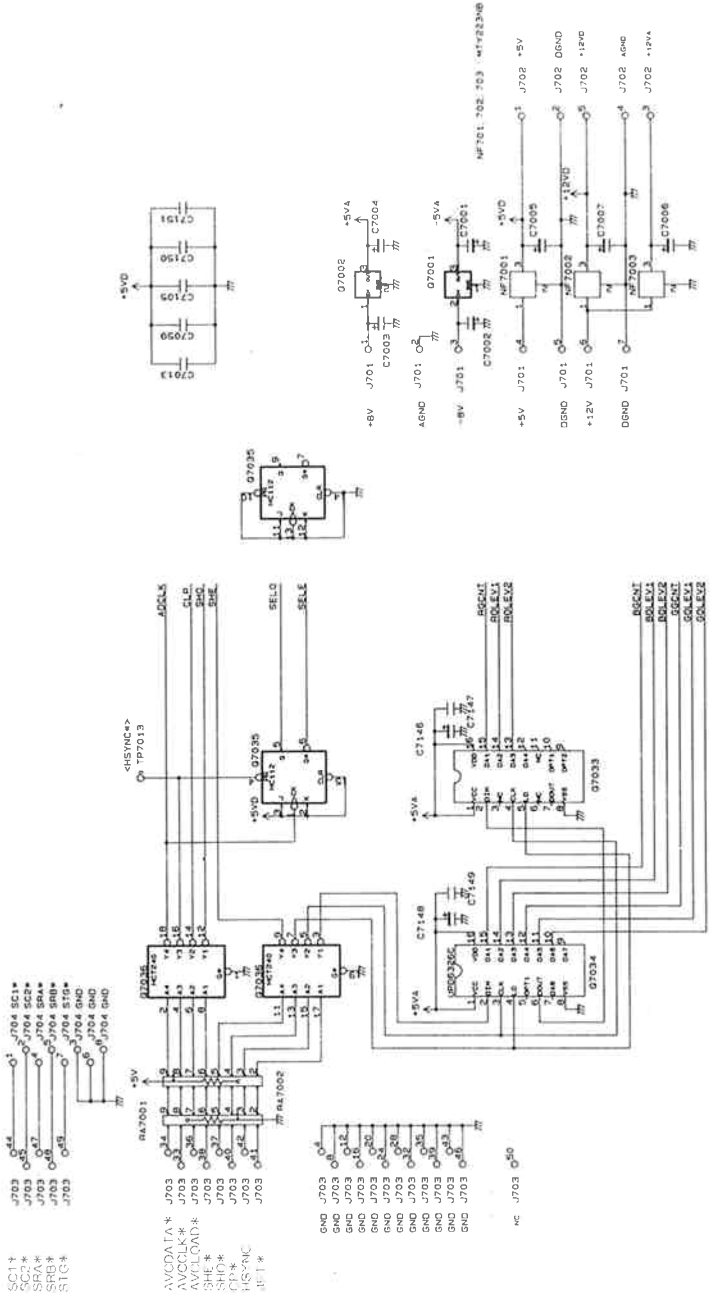

OSAR
J805 1
J805 2 GND
OSBR
J805 5
J805 6 GND
J805 3 NC
J805 4 NC
R819
R818
R816
R817
R820
Q821
Q822
C814
C821
+12VA
CCD-OSAR
R825
R824
R822
R821
Q824
Q823
C813
C823
CCD-OSBR
OSAB
J803 1
J803 2 GND
OSBB
J803 3
J803 4 GND
R804
R805
R806
R809
R810
Q817
Q818
C808
C816
CCD-OSAB
R801
R802
R803
R807
R808
Q815
Q816
C809
C815
CCD-OSBB
OSAG
J804 1
J804 2 GND
OSBG
J804 4
J804 5 GND
J804 3 NC
R830
R829
R828
R827
R826
Q826
Q825
C811
C825
CCD-OSAG
R811
R812
R813
R814
R815
Q819
Q820
C806
C818
CCD-OSBG
Q802
LS365
SIG*
SRB*
S1*
S2*
SRA*
RA801
RA802
+5V
J801 7
J801 5
J801 4
J801 2
J801 1
J801 3
J801 6
J801 8
TG
RB
RA
S2
S1
GND
GND
GND
+5VD
+12VD
+5V
+12VA
C826
C803
C802
C801
C804
D801
Q814
J802 1
J802 2
J802 3
J802 4
J802 5
+5VD
GND
+12VD
GND
+12VA

CCD Driver Circuit Diagram (2/2)

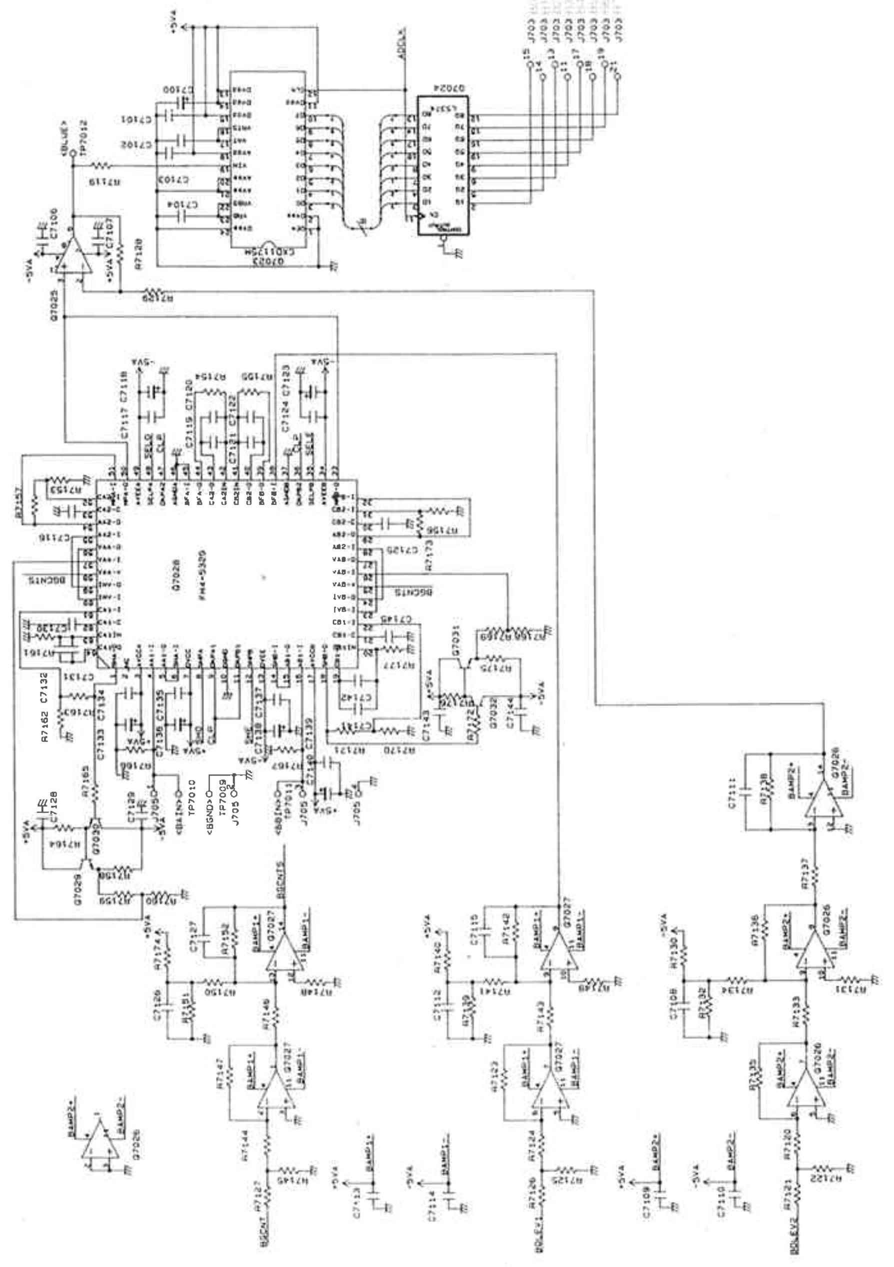

CCD-OSAB
CCD-OSBB
Q808
Q803
Q806
Q807
Q804
Q805
C832
C827
C830
C831
C828
C829
+9V
+12V
Q801
C805
C819
C807
C817
C810
C824
C812
C822
C820
Q813
Q812
Q809
Q811
Q810
C837
C836
C833
C835
C834
CCD-OSBG
CCD-OSAG
CCD-OSBR
CCD-OSAR
SRA*
SRB*
S2*
S1*
STG*

F. ANALOG PROCESSOR CIRCUIT DIAGRAM

Analog Processor Circuit Diagram (1/4)

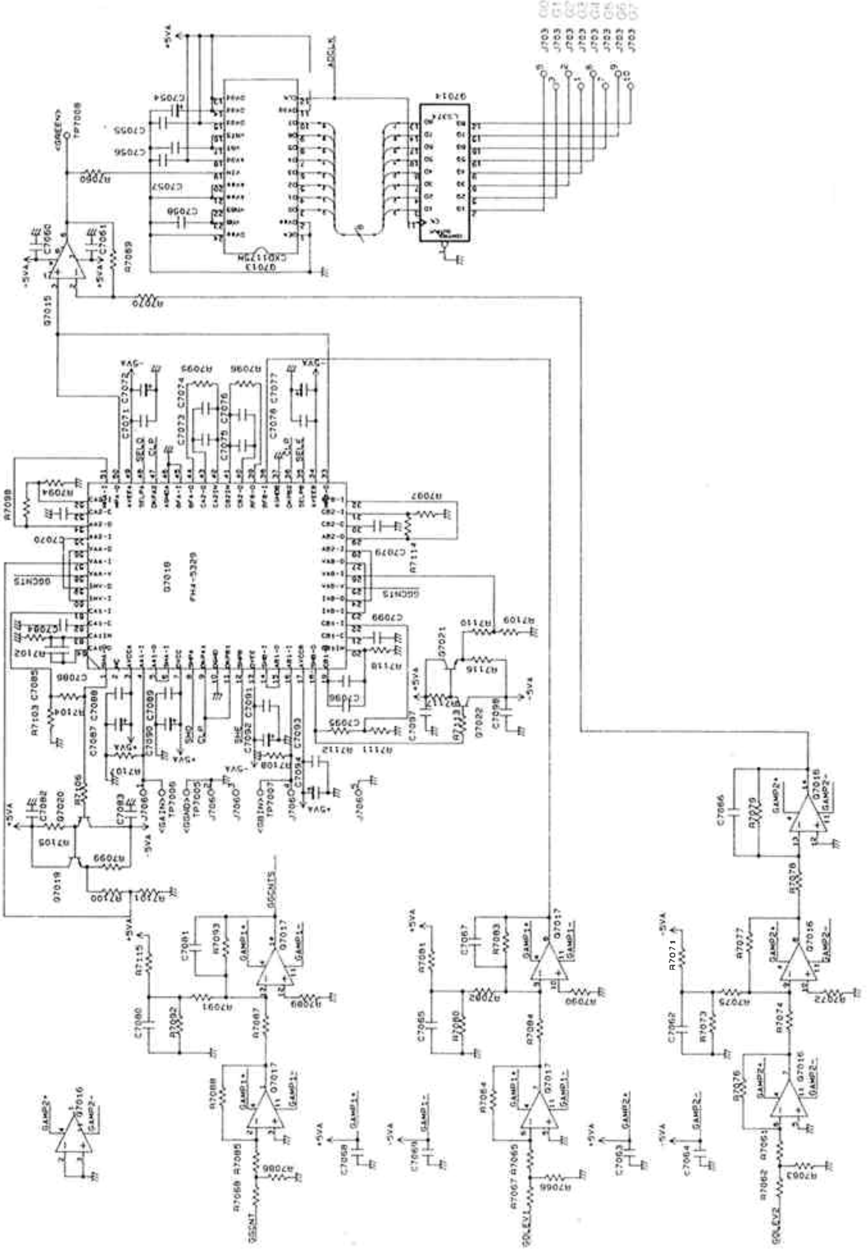

Q7035
HCT240
Q7033
Q7034
Q7001
Q7002
Q7035
HC112
NF7001
NF7002
NF7003
RA7001
RA7002
TP7013
<HSYNC*>
ADCLK
CLP
SHO
SHE
SELO
SELE
RGCNT
ROLEV1
ROLEV2
BGCNT
BOLEV1
BOLEV2
GGCNT
GOLEV1
GOLEV2
C7013
C7050
C7105
C7150
C7151
C7001
C7002
C7003
C7004
C7005
C7006
C7007
C7146
C7147
C7148
C7149
+5VD
+5VA
-5VA
+12VD
+5V
+8V
AGND
-8V
DGND
+12V
J701
J702 +5V
J702 DGND
J702 +12VD
J702 AGND
J702 +12VA
J703
J704 SC1*
J704 SC2*
J704 SRA*
J704 SRB*
J704 STG*
J704 GND
GND
NC
SC1*
SC2*
SRA*
SRB*
STG*
AVCDATA*
AVCCLK*
AVCLOAD*
SHE*
SHO*
CP*
HSYNC

Analog Processor Circuit Diagram (2/4)

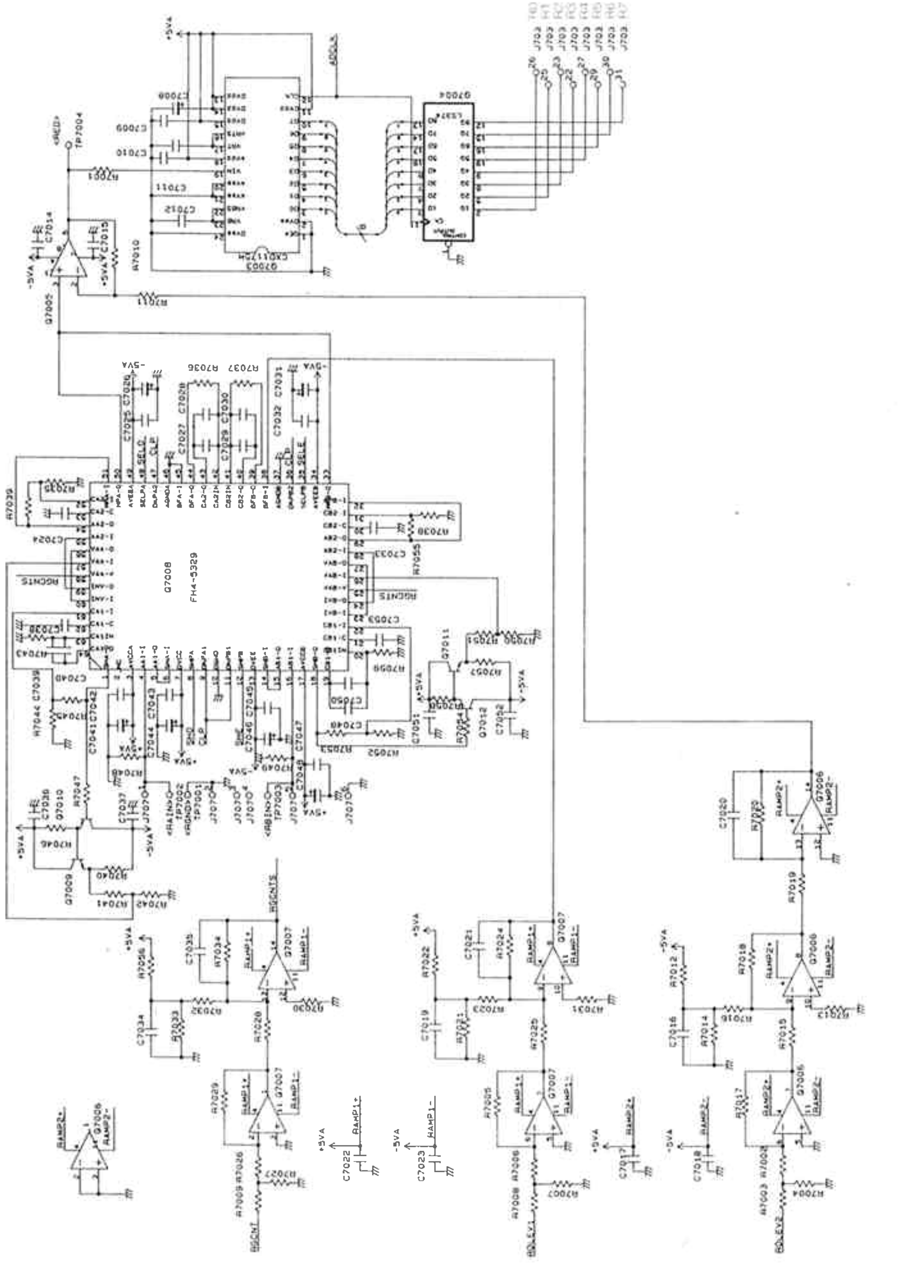


Q7023
CXD1175M
Q7024
Q7025
Q7026
Q7027
Q7028
Q7029
Q7030
Q7031
Q7032
TP7012
<BLUE>
ADCLK
J703
J705
TP7009
TP7010
TP7011
<BGND>
<BAIN>
<BBIN>
BGCNTS
BGCNT
BGLEV1
BGLEV2
BAMP1+
BAMP1-
BAMP2+
BAMP2-
+5VA
-5VA

Analog Processor Circuit Diagram (3/4)

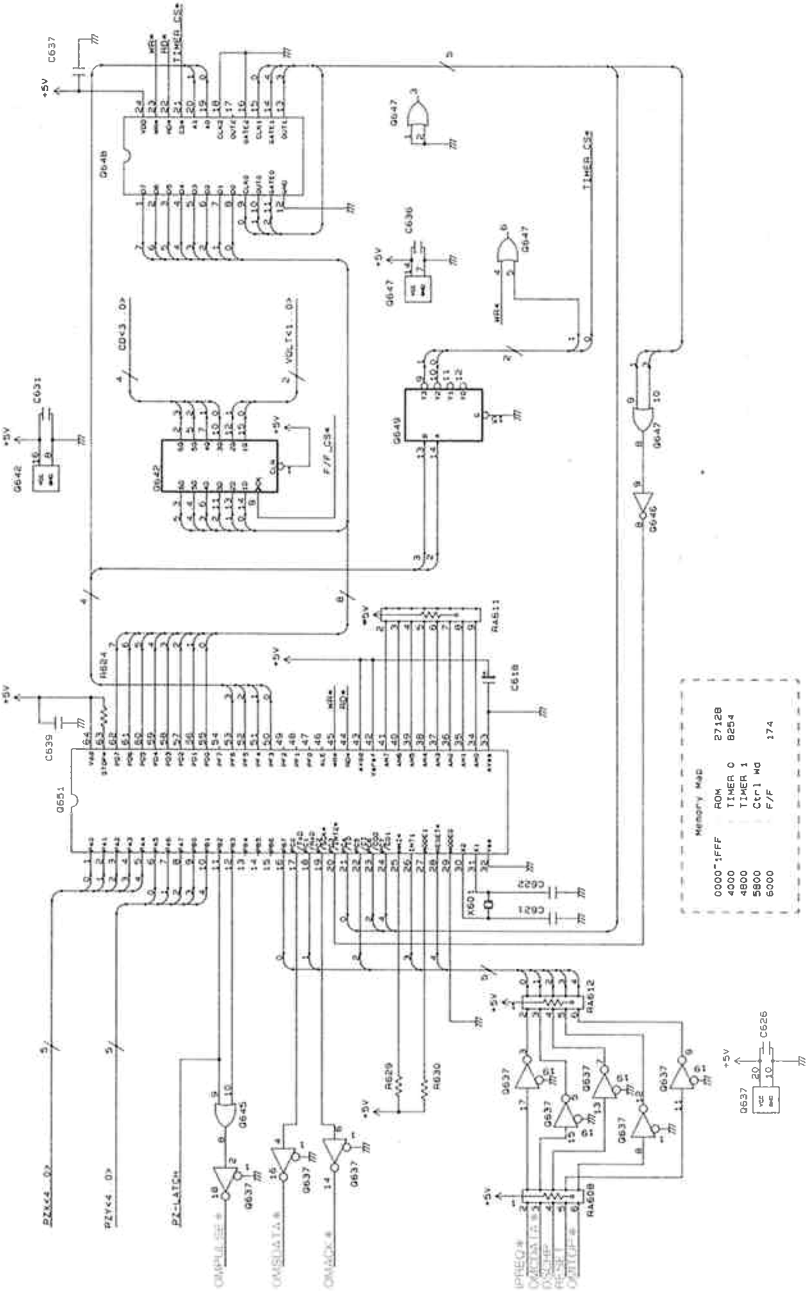

Q7013
CXD1172M
Q7014
LS374
ADCLK
<GREEN>
TP7008
J703 D0
J703 D1
J703 D2
J703 D3
J703 D4
J703 D5
J703 D6
J703 D7
Q7015
Q7018
FH4-5329
Q7019
Q7020
Q7021
Q7022
Q7016
Q7017
GSCNTS
GSCNT
GGLEV1
GGLEV2
GAMP1+
GAMP1-
GAMP2+
GAMP2-
+5VA
-5VA
VAG+
VAG-
<GAIN>
<GGND>
<GBINV>
TP7005
TP7006
TP7007

Analog Processor Circuit Diagram (4/4)


Q7008
FH4-5329
Q7003
CXD1172M
Q7004
TP7004
<RED>
ADCLK
J703 R0
J703 R1
J703 R2
J703 R3
J703 R4
J703 R5
J703 R6
J703 R7
RGCNTS
RGCNT
BGLEV1
BGLEV2
RAMP1+
RAMP1-
RAMP2+
RAMP2-
Q7005
Q7006
Q7007
Q7009
Q7010
Q7011
Q7012
+5VA
-5VA
C7022
C7023
C7017
C7018

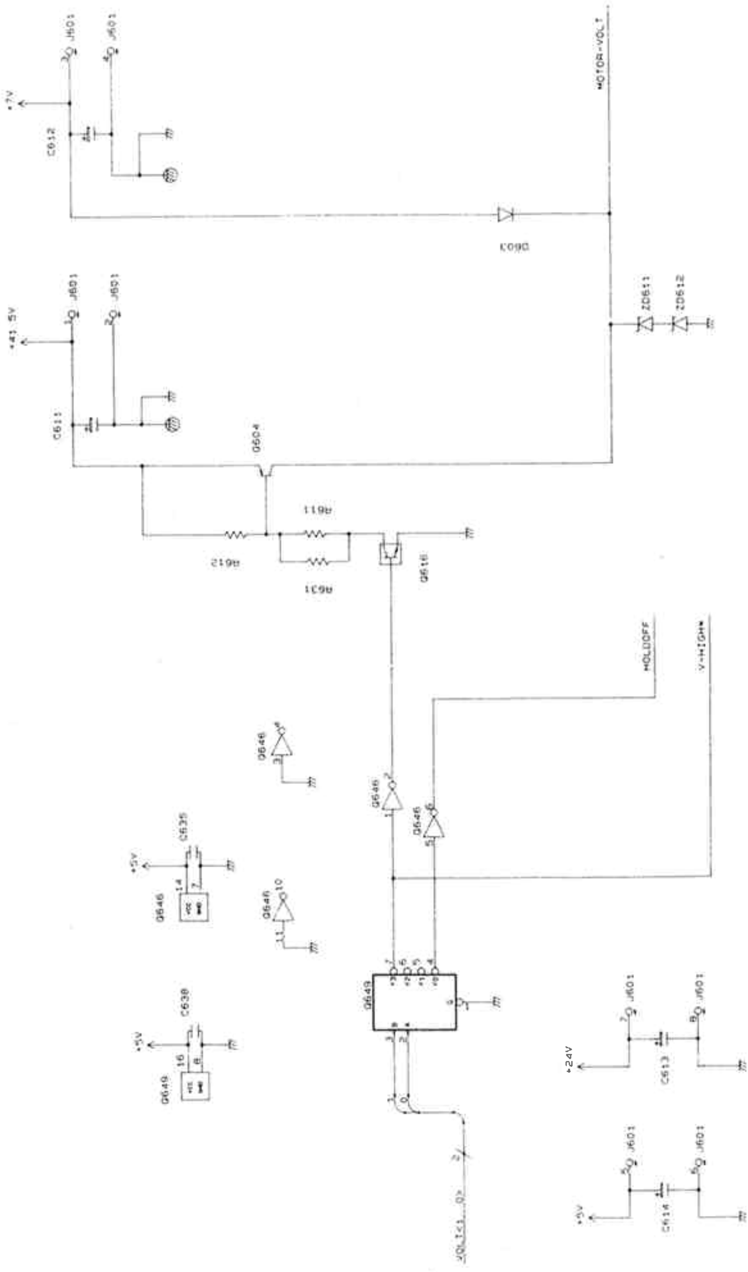
G. SCANNER MOTOR DRIVER CIRCUIT DIAGRAM

Scanner Motor Driver Circuit Diagram (1/5)

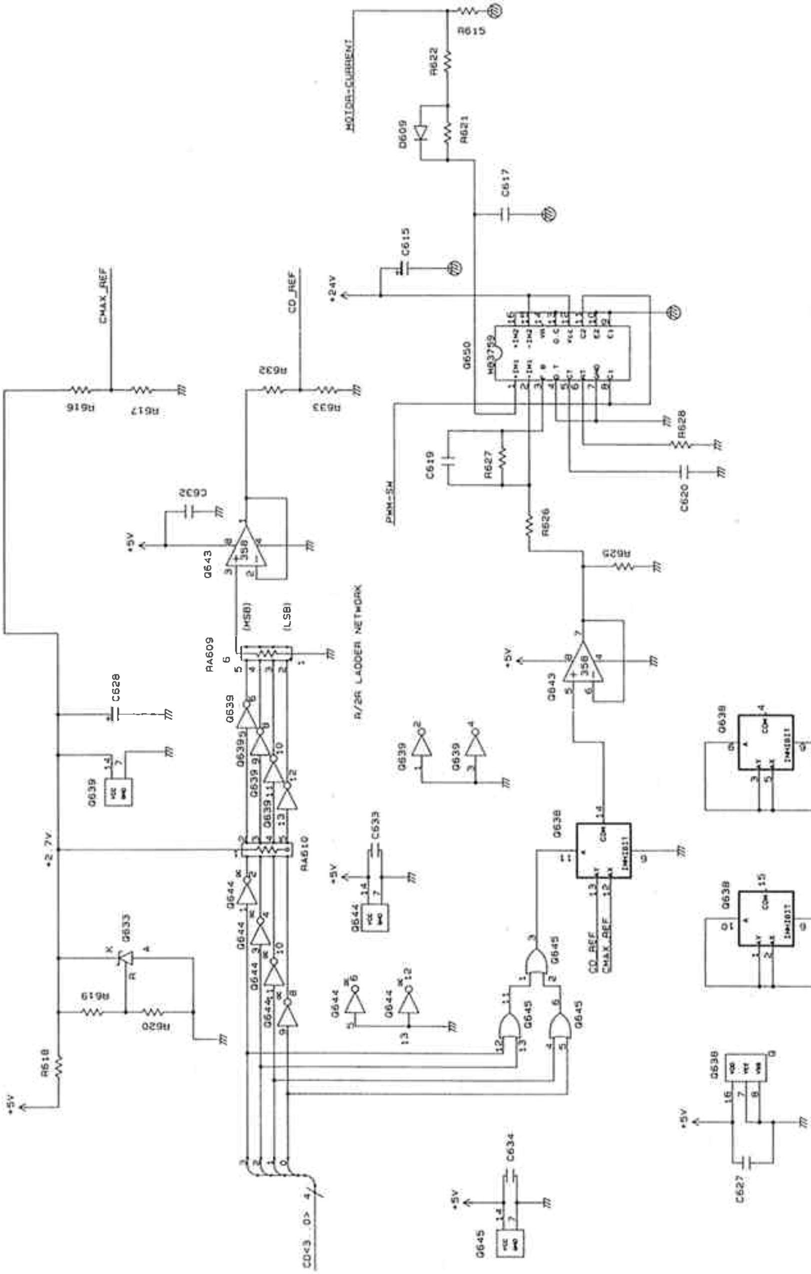


C637
+5V
WR*
RD*
TIMER_CS*
Q648
Q647
C636
TIMER_CS*
WR*
C631
Q642
CD<3..0>
VOLT<1..0>
F/F_CS*
Q649
Q646
RA624
RA611
C639
C618
Q651
X601
C621
C622
Memory Map
0000~1FFF ROM 27128
4000 TIMER 0 8254
4800 TIMER 1
5800 Ctrl Wd
6000 F/F 174
RA612
R629
R630
Q645
Q637
C626
RA608
PZX<4..0>
PZY<4..0>
PZ-LATCH
OMPULSE*
OMSDATA*
OMACK*
IPREQ*
OMCNTR*

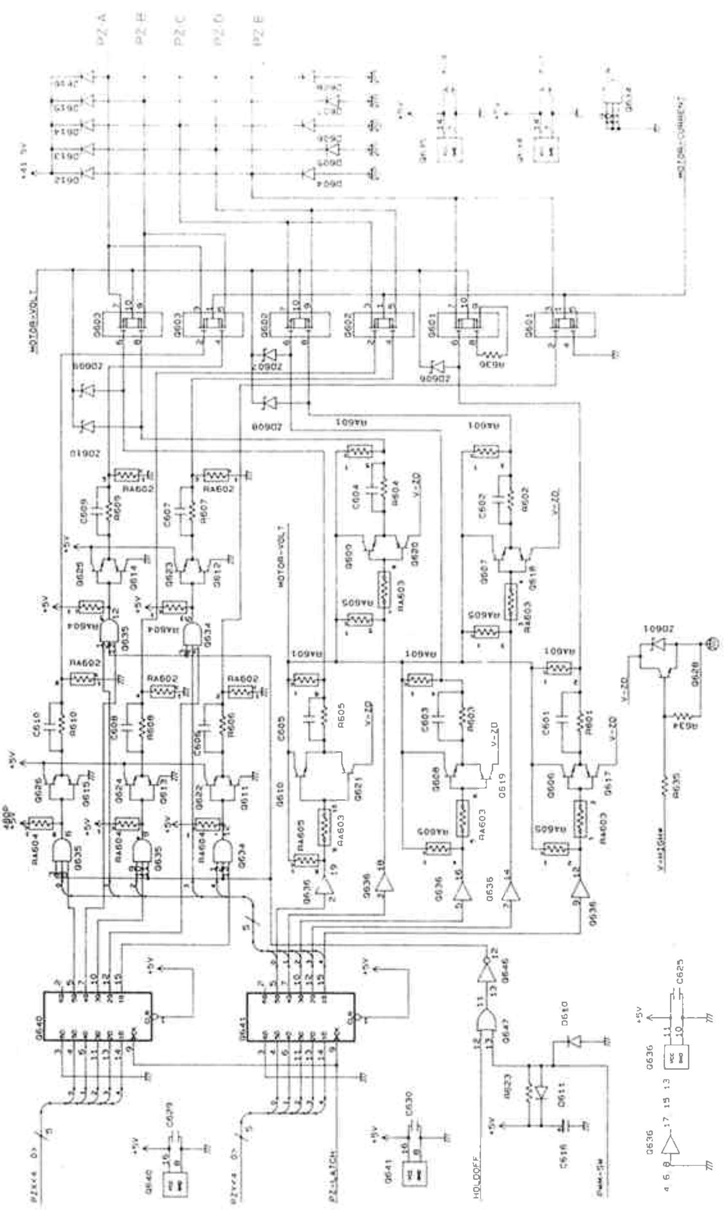
Scanner Motor Driver Circuit Diagram (2/5)


+7V
J601
C612
D603
MOTOR-VOLT
+41.5V
C611
Q604
ZD611
ZD612
R611
R612
R631
Q616
HOLDOFF
V-HIGH*
Q646
C635
+5V
Q649
C638
+24V
C613
C614
VOLT<1..0>

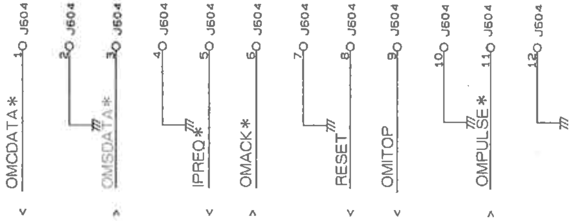
Scanner Motor Driver Circuit Diagram (3/5)

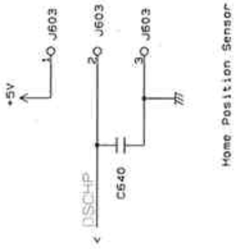

MOTOR-CURRENT
R615
R622
R621
D609
C617
C615
+24V
CMAX_REF
CD_REF
R616
R617
R632
R633
Q650
MB3759
PWM-SW
C619
R627
R626
R628
C620
R625
C632
+5V
Q643
358
RA609
(MSB)
(LSB)
R/2R LADDER NETWORK
C628
Q639
+2.7V
RA610
Q633
R619
R620
R618
Q644
C633
Q645
Q638
COM
INHIBIT
CD_REF
CMAX_REF
C627
C634
CD<3 .. 0>

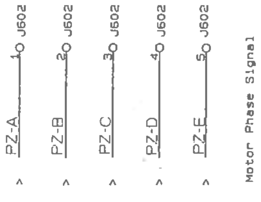
Scanner Motor Driver Circuit Diagram (4/5)


PZ A
PZ B
PZ C
PZ D
PZ E
+41.5V
MOTOR-VOLT
MOTOR-CURRENT
Q601
Q602
Q603
Q640
Q641
Q646
Q647
Q636
Q635
Q634
V-ZD
V-HIGH
PZ-LATCH
HOLDOFF
PWM-SW
+5V
C625
C629
C630
C616
D610
D611
R623
R634
R635
Q628
RA601
RA602
RA603
RA604
RA605

Scanner Motor Driver Circuit Diagram (5/5)

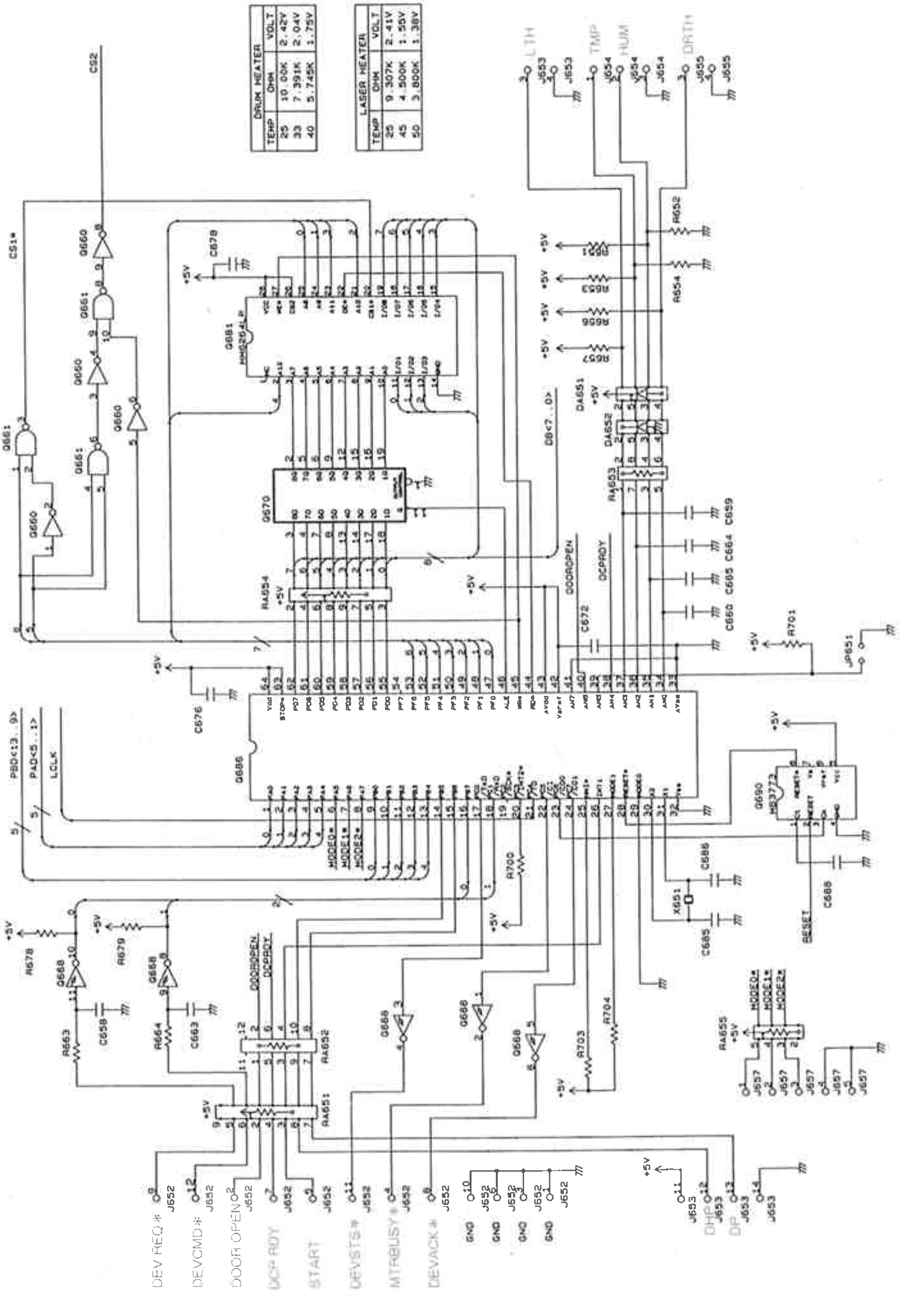

OMCDATA*
OMSDATA*
IPREQ*
OMACK*
RESET
OMITOP
OMPULSE*
1 J604
2 J604
3 J604
4 J604
5 J604
6 J604
7 J604
8 J604
9 J604
10 J604
11 J604
12 J604


+5V
1 J603
2 J603
3 J603
DSCHP
C540
Home Position Sensor


PZ-A
PZ-B
PZ-C
PZ-D
PZ-E
1 J602
2 J602
3 J602
4 J602
5 J602
Motor Phase Signal

H. DEVELOPING ASSEMBLY SHIFT MOTOR DRIVER CIRCUIT DIAGRAM

Developing Assembly Shift Motor Driver Circuit Diagram (1/3)

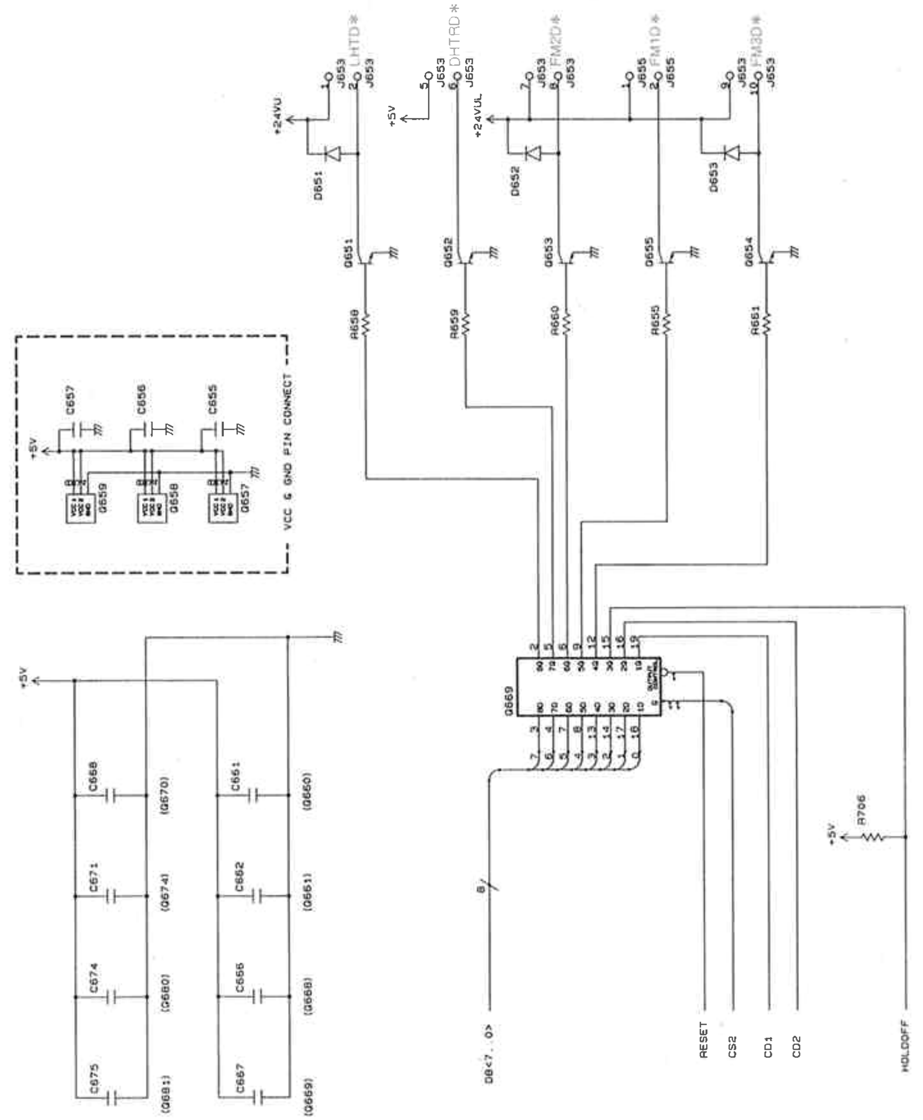


DRUM HEATER		
TEMP	OHM	VOLT
25	10.00K	2.42V
33	7.391K	2.04V
40	5.745K	1.75V

LASER HEATER		
TEMP	OHM	VOLT
25	9.307K	2.41V
45	4.500K	1.55V
50	3.800K	1.38V

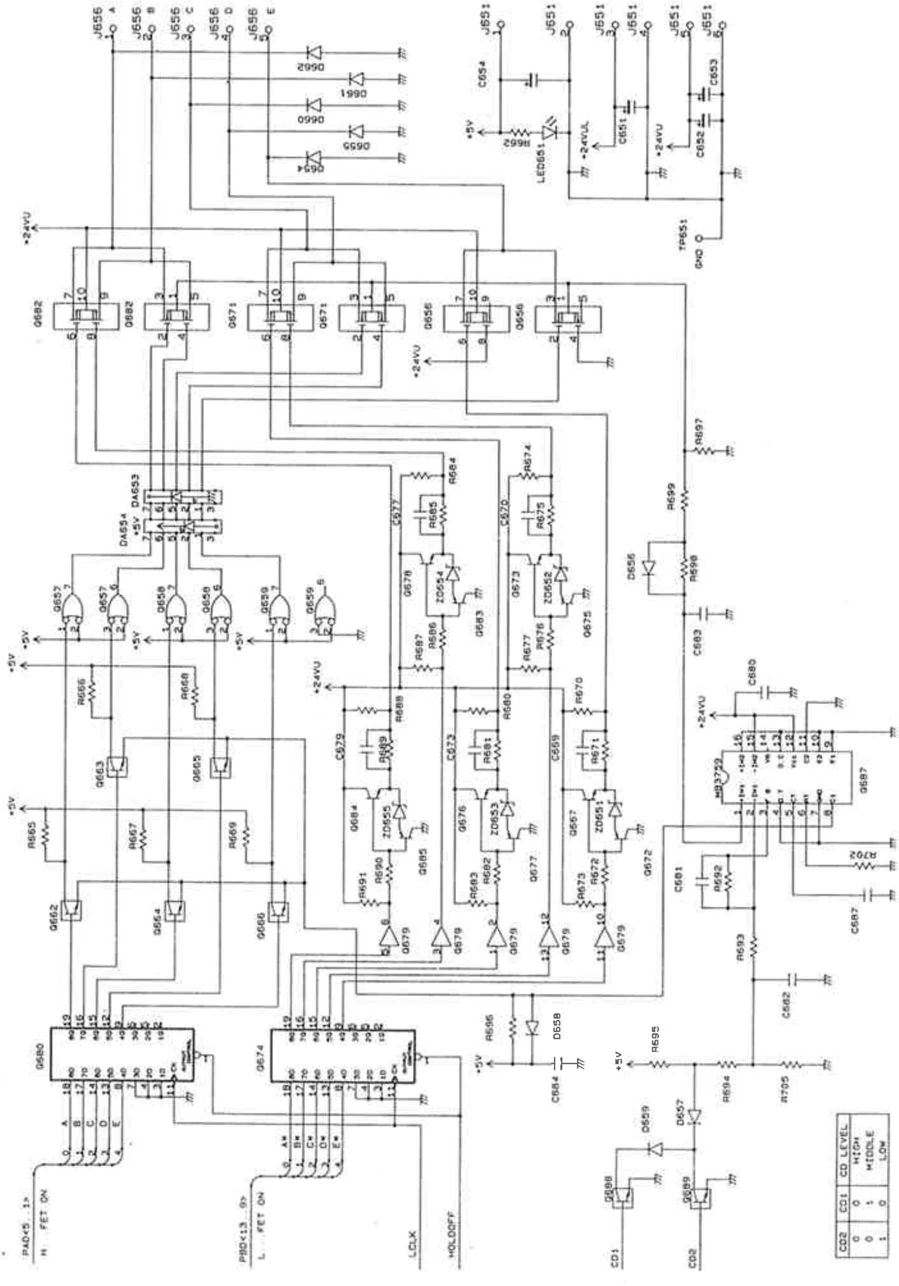
CS2
CS1*
Q660
Q661
Q681
HM6264LP
Q670
Q686
Q690
M63773
Q688
C678
C676
C672
C659
C664
C665
C660
C686
C685
C658
C663
RA654
RA653
RA652
RA651
RA655
DA651
DA652
R652
R651
R653
R654
R656
R657
R678
R679
R663
R664
R700
R701
R703
R704
X651
JP651
+5V
PBO<13..9>
PAO<5..1>
LCLK
DB<7..0>
DOOROPEN
DCPRDY
MODE0*
MODE1*
MODE2*
RESET
LTH
TMP
HUM
DRTH
J653
J654
J655
J652
J657
DEV REQ*
DEVCMD*
DOOR OPEN
DCP RDY
START
DEVSTS*
MTRBUSY*
DEVACK*
GND
DHP
DP

Developing Assembly Shift Motor Driver Circuit Diagram (2/3)



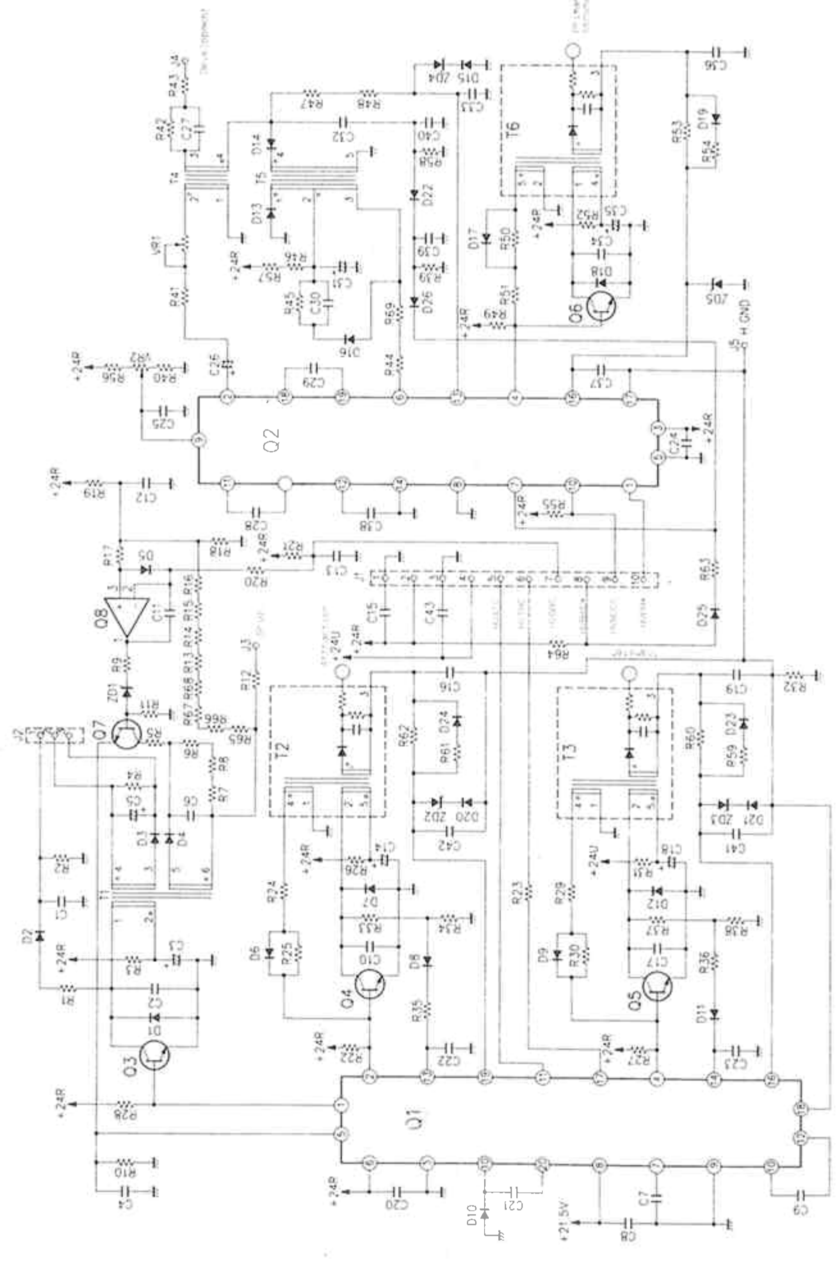
+24VU
J653
LHTD*
+5V
DHTRD*
+24VUL
FM2D*
J655
FM1D*
FM3D*
D651
D652
D653
Q651
Q652
Q653
Q655
Q654
R658
R659
R660
R655
R661
C657
C656
C655
Q659
Q658
Q657
VCC & GND PIN CONNECT
Q669
C668
C671
C674
C675
C661
C662
C656
C667
(Q670)
(Q674)
(Q680)
(Q681)
(Q660)
(Q661)
(Q668)
(Q669)
8
DB<7..0>
RESET
CS2
CD1
CD2
HOLDOFF
R706

Developing Assembly Shift Motor Driver Circuit Diagram (3/3)

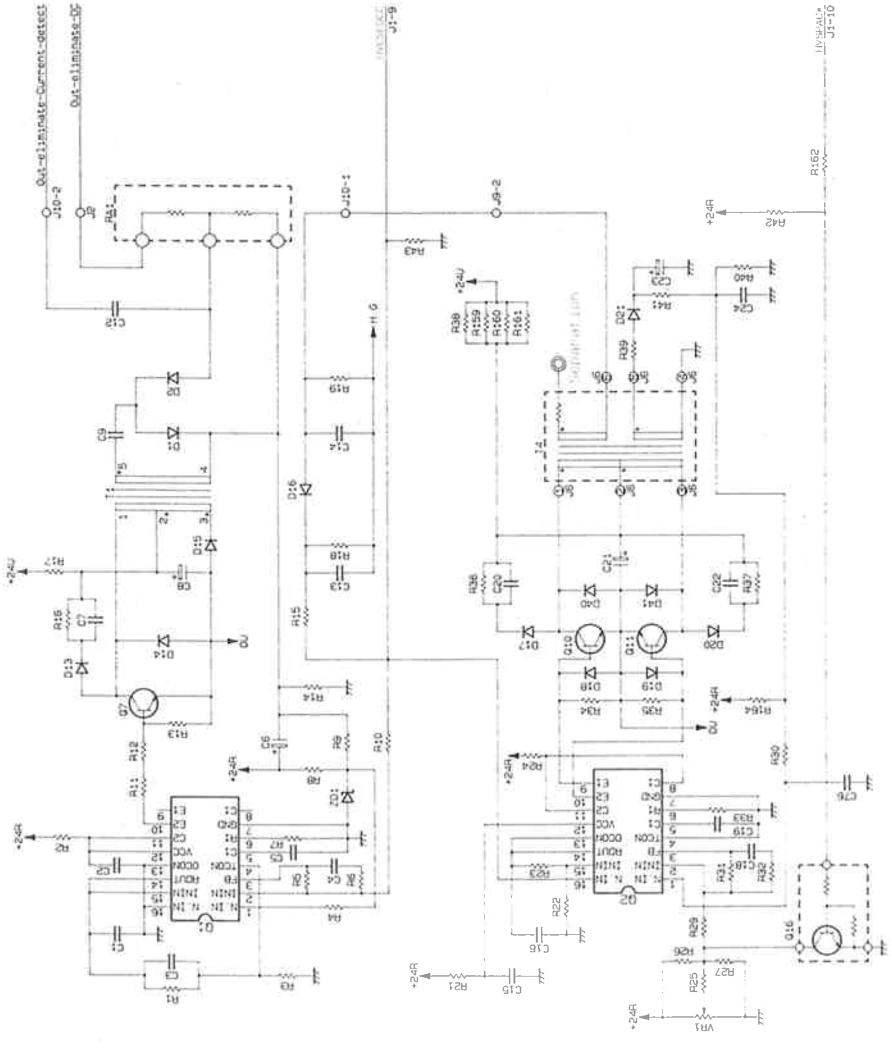

J656 1 A
J656 2 B
J656 3 C
J656 4 D
J656 5 E
D662
D661
D660
D655
D654
J651 1
J651 2
J651 3
J651 4
J651 5
J651 6
C654
+5V
R662
LED651
+24VUL
C651
+24VU
C652
C653
TP651 GND
Q682
Q671
Q656
DA654
DA653
Q657
Q658
Q659
R666
R668
Q663
Q665
R665
R667
R669
Q662
Q664
Q666
Q680
Q674
PAD<5..1> H: FET ON
PBD<13..9> L: FET ON
LCLK
HOLDOFF
R684
C677
R685
Q678
ZD654
Q683
R687
R686
R674
C670
R675
Q673
ZD652
Q675
R677
R676
R688
C679
R689
Q684
ZD655
Q685
R691
R690
R680
C673
R681
Q676
ZD653
Q677
R683
R682
R670
C669
R671
Q667
ZD651
Q672
R673
R672
Q679
R697
R699
D656
R698
C683
C680
Q687
MB3759
R702
C681
R692
C687
R693
C682
R696
D658
C684
R695
R694
R705
D659
D657
Q688
Q689
CD1
CD2

CD2	CD1	CD LEVEL
0	0	HIGH
0	1	MIDDLE
1	0	LOW

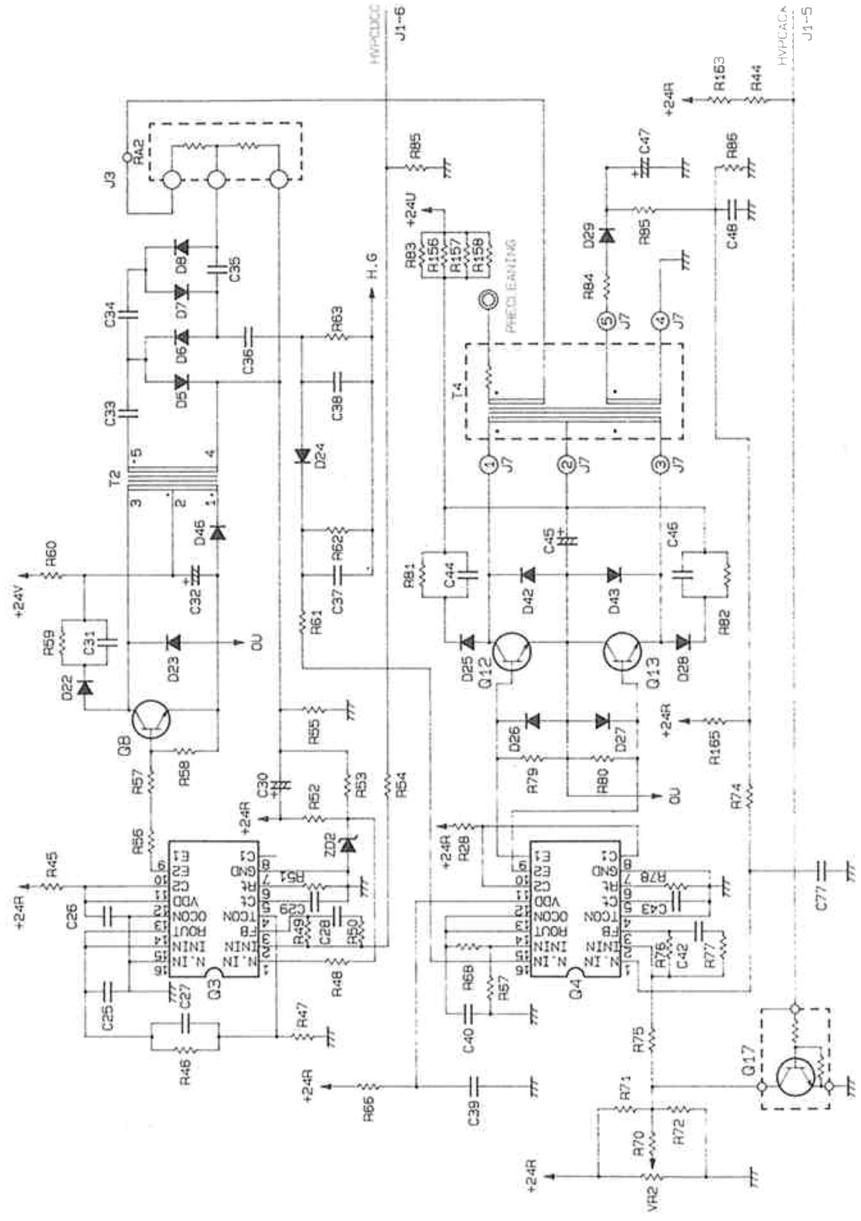
I. HVDC


Q1
Q2
Q3
Q4
Q5
Q6
Q7
Q8
T1
T2
T3
T4
T5
T6
J1
J2
J3
J4
J5
H GND
+24R
+24U
+24P
+21.5V
VR1
VR2

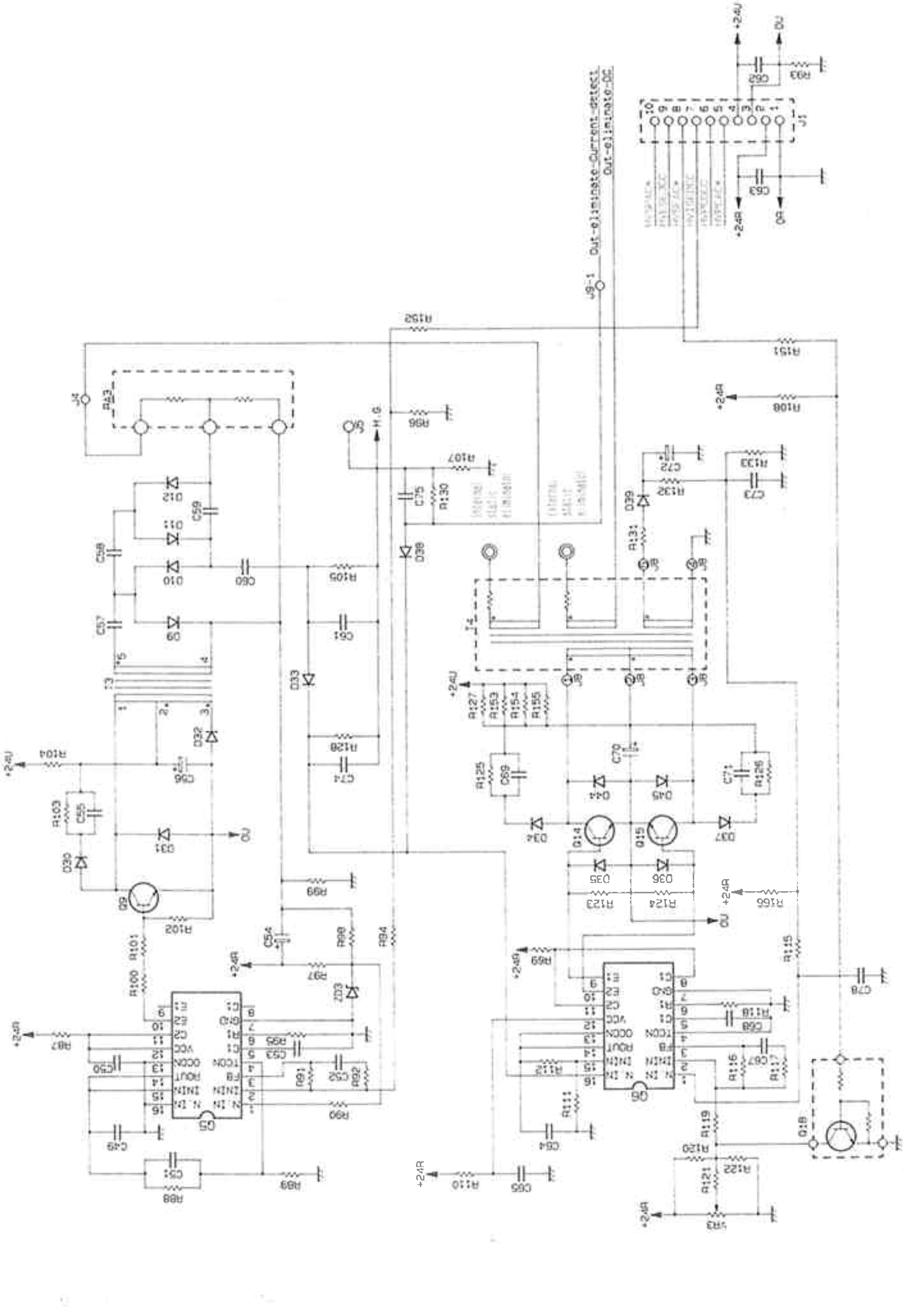
J. HVAC (1/3)


Out-eliminate-Current-detect
Out-eliminate-DC
J10-2
J2
RA1
J10-1
J9-2
J1-9
HVSPAC*
J1-10
R162
+24R
R42
R43
C12
D2
D1
C9
T1
D15
C8
R17
+24V
R16
C7
D13
D14
Q7
R13
R12
R11
Q1
R2
C2
C1
C3
R1
R3
R4
R5
C4
C5
R7
R8
R9
ZD1
C6
R14
R10
D16
C14
R19
R18
C13
R15
H.G
R38
R159
R160
R161
T4
R39
D21
C23
R41
R40
C24
C21
C20
R36
D17
D40
D41
C22
R37
D20
Q10
Q11
D18
D19
R34
R35
R184
R24
Q2
R33
C19
C18
R31
R32
R23
R22
C16
R21
C15
R30
C26
R29
R26
R25
R27
VR1
Q16
VCC
GND
DCON
ROUT
TCON
FB
N.IN
INIM
E1
E2
C1
C2
RT
CT

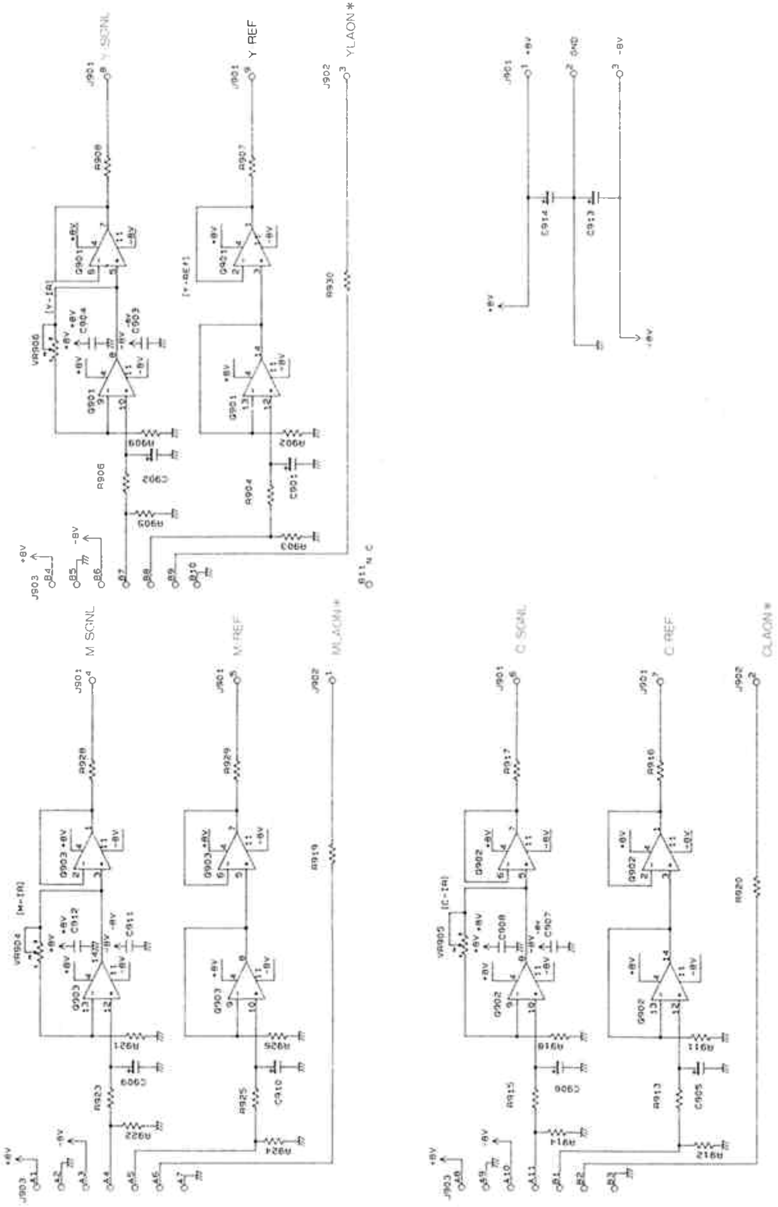
HVAC (2/3)


HVPCDCC
J1-6
HVPCACA
J1-5
J3
RA2
C34
C33
D8
D7
D6
D5
C35
C36
C38
R63
H.G
R85
+24U
R83
R156
R157
R158
PRECLEANING
T4
J7
T2
+24V
R60
C32
D46
D24
R62
C37
R61
R59
C31
D22
D23
0U
Q8
R57
R58
R55
C30
R52
R53
R54
+24R
ZD2
R56
R45
C26
C25
C27
Q3
R46
R47
R48
R49
R50
R51
C28
C29
E1
E2
C2
VDD
OCON
ROUT
I.NIN
N.IN
C1
GND
RT
CT
TCON
FB
N.IN
R81
C44
D42
D43
C45
C46
R82
D25
Q12
Q13
D28
D26
D27
R79
R80
R165
R74
R28
Q4
R68
R67
C40
C39
R66
R75
R76
C42
R77
C43
R78
C77
R71
R70
R72
VR2
Q17
R84
D29
R95
C47
R86
C48
R44
R163

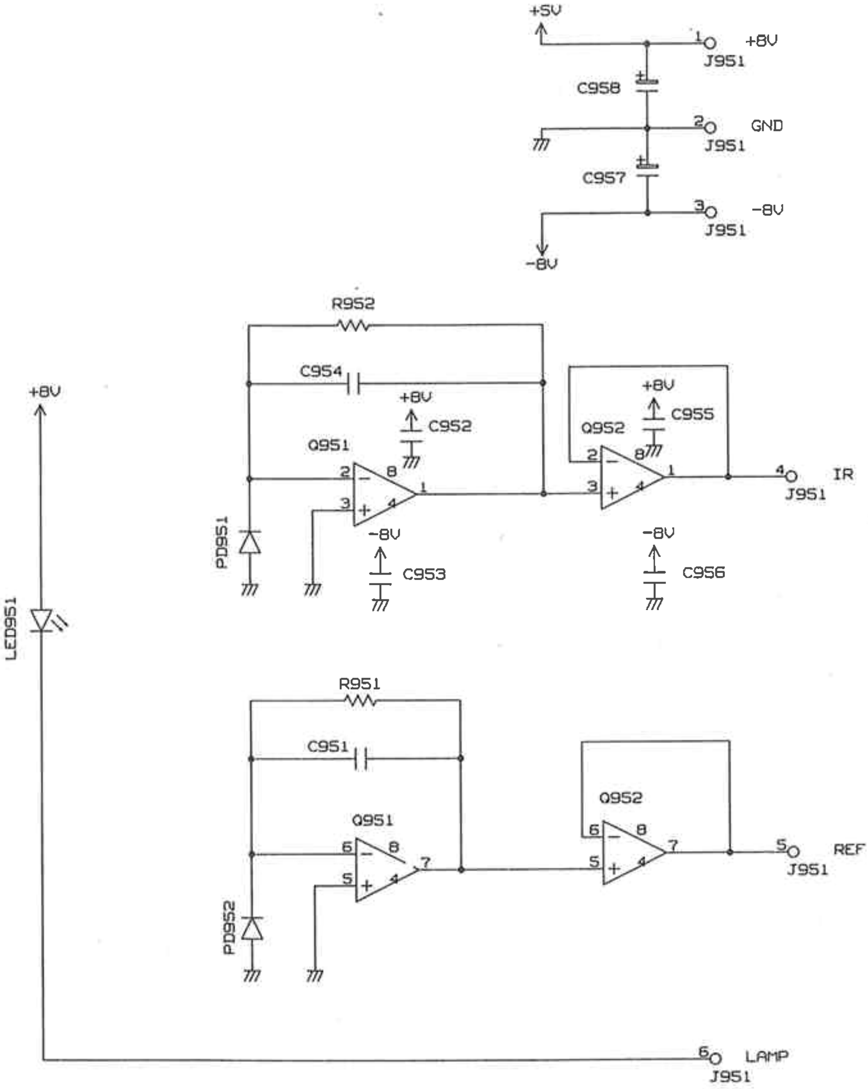
HVAC (3/3)


+24V
0V
0R
+24R
J1
C62
C63
R93
Out-eliminate-Current-detect
Out-eliminate-DC
J9-1
R152
R151
R108
R43
J4
J5
H.G
R96
R107
R130
C75
D38
T3
T4
Q5
Q6
Q9
Q14
Q15
Q16
D9
D10
D11
D12
D30
D31
D32
D33
D34
D35
D36
D37
D39
D44
D45
ZD3
C49
C50
C51
C52
C53
C54
C55
C56
C57
C58
C59
C60
C61
C64
C65
C67
C68
C69
C70
C71
C72
C73
C74
C78
R87
R88
R89
R90
R91
R92
R94
R95
R97
R98
R99
R100
R101
R102
R103
R104
R105
R110
R111
R112
R115
R116
R117
R118
R119
R120
R121
R122
R123
R124
R125
R126
R127
R128
R131
R132
R133
R153
R154
R155
R166
R69
VR3

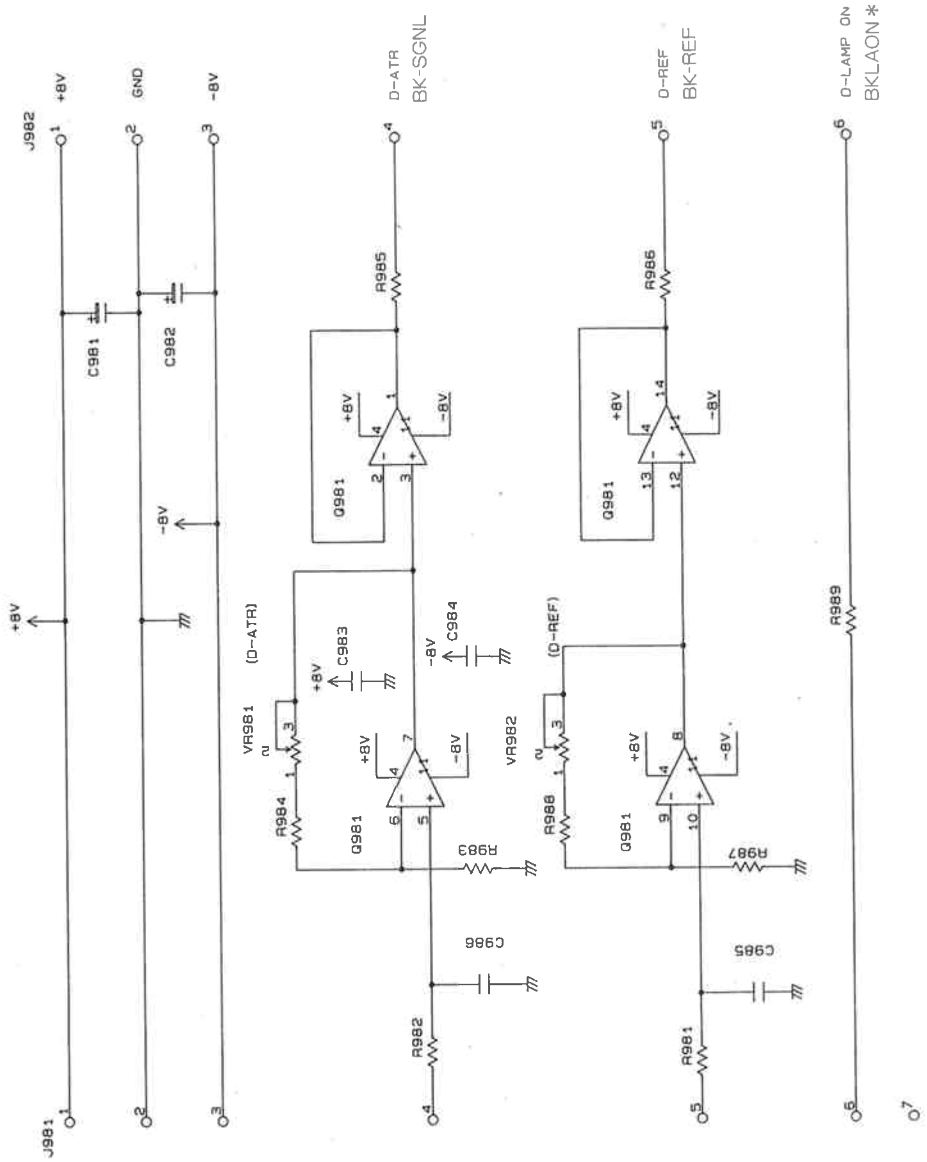
K. COLOR TONER CONCENTRATION ADJUSTING CIRCUIT DIAGRAM


J901
Y SGNL
Y REF
J902
YLAON*
+8V
GND
-8V
C914
C913
R908
R907
R930
Q901
[Y-IR]
[Y-REF]
VR906
C904
C903
R909
R906
R905
C902
R902
R904
C901
R903
J903
B4
B5
B6
B7
B8
B9
B10
B11
N.C
M SGNL
M REF
MLAON*
R928
R929
R919
Q903
[M-IR]
VR904
C912
C911
R921
C909
R923
R922
R926
C910
R925
R924
A1
A2
A3
A4
A5
A6
A7
C SGNL
C REF
CLAON*
R917
R916
R920
Q902
[C-IR]
VR905
C908
C907
R918
C906
R915
R914
R911
C905
R913
R912
A8
A9
A10
A11
B1
B2
B3

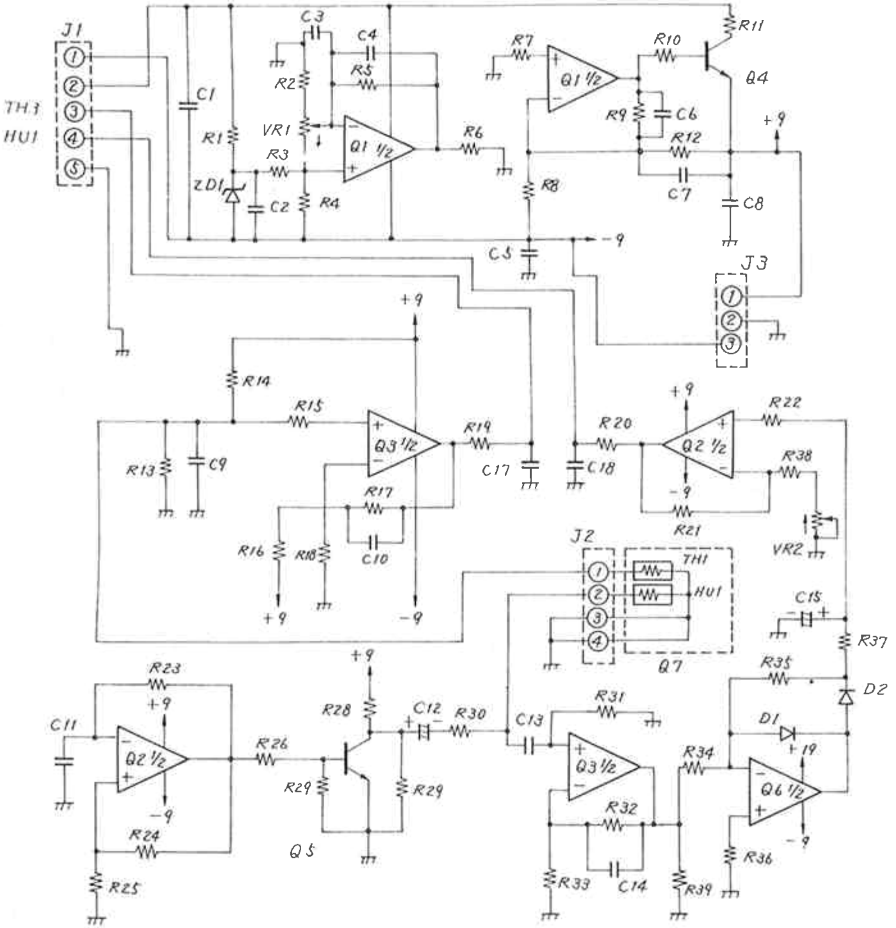
L. TONER CONCENTRATION SENSOR CIRCUIT DIAGRAM


+5V
+8V
1
J951
C958
2
GND
J951
C957
3
-8V
J951
-8V
R952
C954
+8V
+8V
C952
C955
Q951
Q952
2
8
1
3
4
IR
J951
4
PD951
-8V
-8V
C953
C956
LED951
R951
C951
Q952
Q951
6
8
7
5
4
REF
J951
5
PD952
6
LAMP
J951

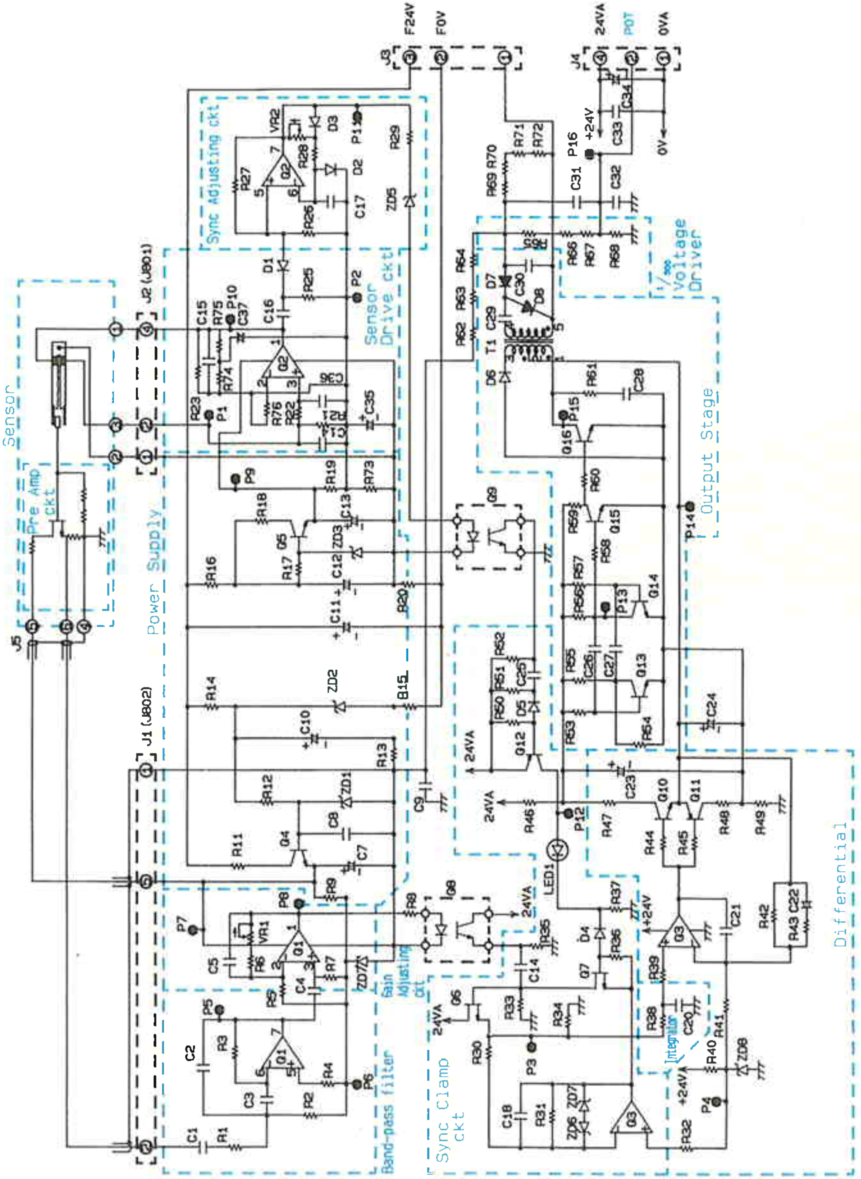
M. BLACK TONER CONCENTRATION ADJUSTING CIRCUIT DIAGRAM


J982
+8V
GND
-8V
D-ATR
BK-SGNL
D-REF
BK-REF
D-LAMP ON
BKLAON*
C981
C982
R985
R986
Q981
R989
(D-ATR)
(D-REF)
VR981
VR982
C983
C984
R984
R983
R988
R987
C986
C985
R982
R981
J981

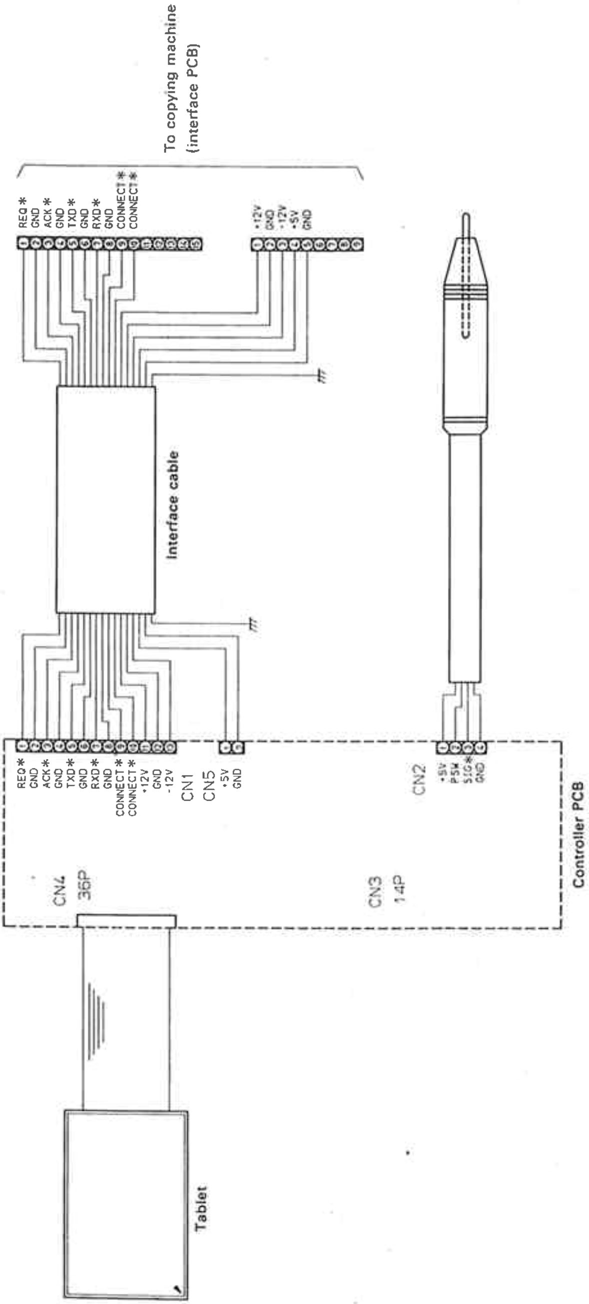
N. ENVIRONMENT MEASURING CIRCUIT DIAGRAM


J1
TH1
HU1
①
②
③
④
⑤
C1
R1
ZD1
C2
C3
C4
R2
R5
VR1
R3
R4
Q1 1/2
R6
R7
Q1 1/2
R8
C5
R9
C6
R10
R11
Q4
R12
C7
C8
+9
-9
J3
①
②
③
+9
R14
R15
Q3 1/2
R13
C9
R19
C17
R17
R16
R18
C10
+9
-9
R20
C18
+9
Q2 1/2
R22
R38
-9
R21
VR2
J2
TH1
HU1
①
②
③
④
Q7
C15
R37
R35
D2
D1
+19
R34
Q6 1/2
-9
R36
R23
+9
C11
Q2 1/2
-9
R24
R25
R26
+9
R28
R29
R29
Q5
C12
R30
C13
R31
Q3 1/2
R32
R33
C14
R39

O. POTENTIAL MEASURING UNIT CIRCUIT DIAGRAM


Sensor
Pre Amp ckt
Power Supply
Sensor Drive ckt
Sync Adjusting ckt
1/300 Voltage Driver
Output Stage
Differential
Integrator
Sync Clamp ckt
Gain Adjusting ckt
Band-pass filter
J1 (J802)
J2 (J801)
J3
J4
J5
F24V
F0V
24VA
POT
0VA
+24V
0V
24VA
T1
LED1
Q1
Q2
Q3
Q4
Q5
Q6
Q7
Q8
Q9
Q10
Q11
Q12
Q13
Q14
Q15
Q16
VR1
VR2
P1
P2
P3
P4
P5
P6
P7
P8
P9
P10
P12
P13
P14
P15
P16

P. IMAGE EDITING UNIT GENERAL CIRCUIT DIAGRAM


To copying machine
(interface PCB)
REQ*
GND
ACK*
GND
TXD*
GND
RXD*
GND
CONNECT*
CONNECT*
+12V
GND
-12V
+5V
GND
Interface cable
REQ*
GND
ACK*
GND
TXD*
GND
RXD*
GND
CONNECT*
CONNECT*
+12V
GND
-12V
CN1
CN5
+5V
GND
CN2
+5V
PSW
SIG*
GND
Controller PCB
CN4
36P
CN3
14P
Tablet

Q. IMAGE EDITING UNIT INTERFACE CIRCUIT DIAGRAM

Image Editing Unit Interface Circuit Diagram (1/5)

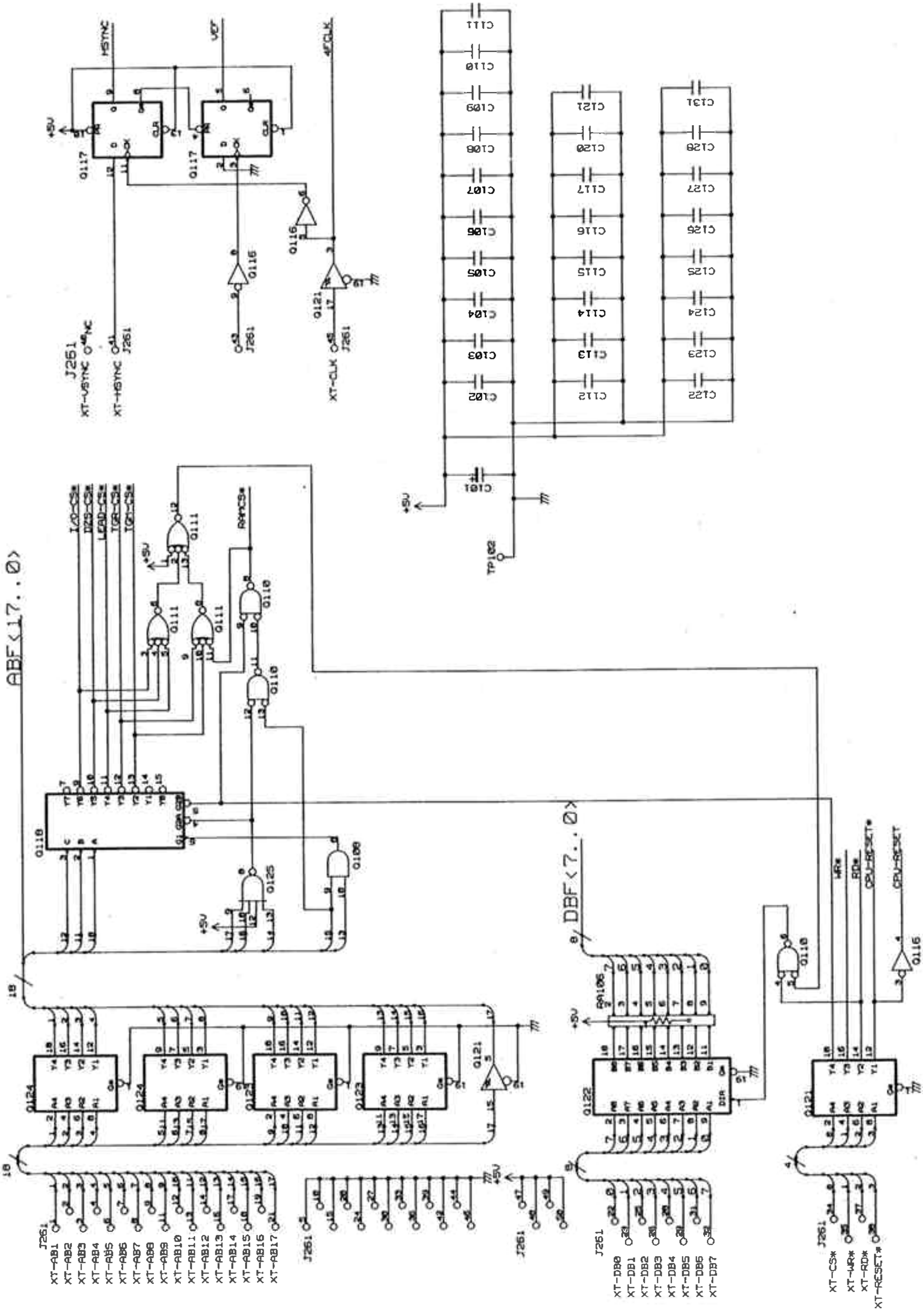

HSYNC
VEF
4FCLK
Q117
Q117
Q116
Q116
Q121
+5V
J261
XT-VSYNC
XT-HSYNC
XT-CLK
NC
C101
C102
C103
C104
C105
C106
C107
C108
C109
C110
C111
C112
C113
C114
C115
C116
C117
C118
C119
C120
C121
C122
C123
C124
C125
C126
C127
C128
C129
C130
C131
TP102
ABF<17..0>
DBF<7..0>
I/O-CS*
LEAD-CS*
RAMCS*
Q111
Q110
Q118
Q125
Q109
Q124
Q123
Q122
Q121
RA105
WR*
RD*
CPU-RESET*
XT-AB1
XT-AB2
XT-AB3
XT-AB4
XT-AB5
XT-AB6
XT-AB7
XT-AB8
XT-AB9
XT-AB10
XT-AB11
XT-AB12
XT-AB13
XT-AB14
XT-AB15
XT-AB16
XT-AB17
XT-DB0
XT-DB1
XT-DB2
XT-DB3
XT-DB4
XT-DB5
XT-DB6
XT-DB7
XT-CS*
XT-WR*
XT-RD*
XT-RESET*

Image Editing Unit Interface Circuit Diagram (2/5)

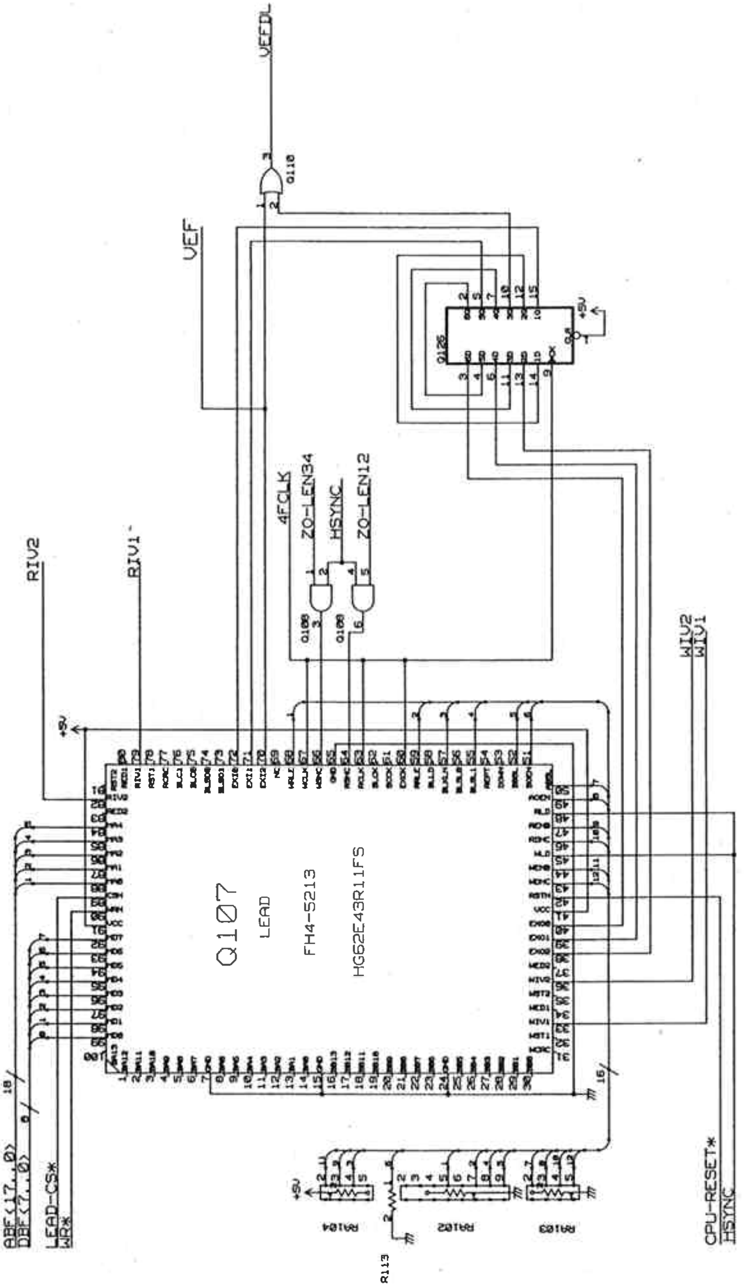

VEFDL
Q110
VEF
Q126
+5V
RIV2
RIV1
4FCLK
ZO-LEN34
HSYNC
ZO-LEN12
Q108
Q108
WIV2
WIV1
Q107
LEAD
FH4-5213
HG62E43R11FS
ABF<17..0>
DBF<7..0>
LEAD-CS*
WR*
18
8
16
RA104
RA102
RA103
R113
CPU-RESET*
HSYNC

Image Editing Unit Interface Circuit Diagram (3/5)

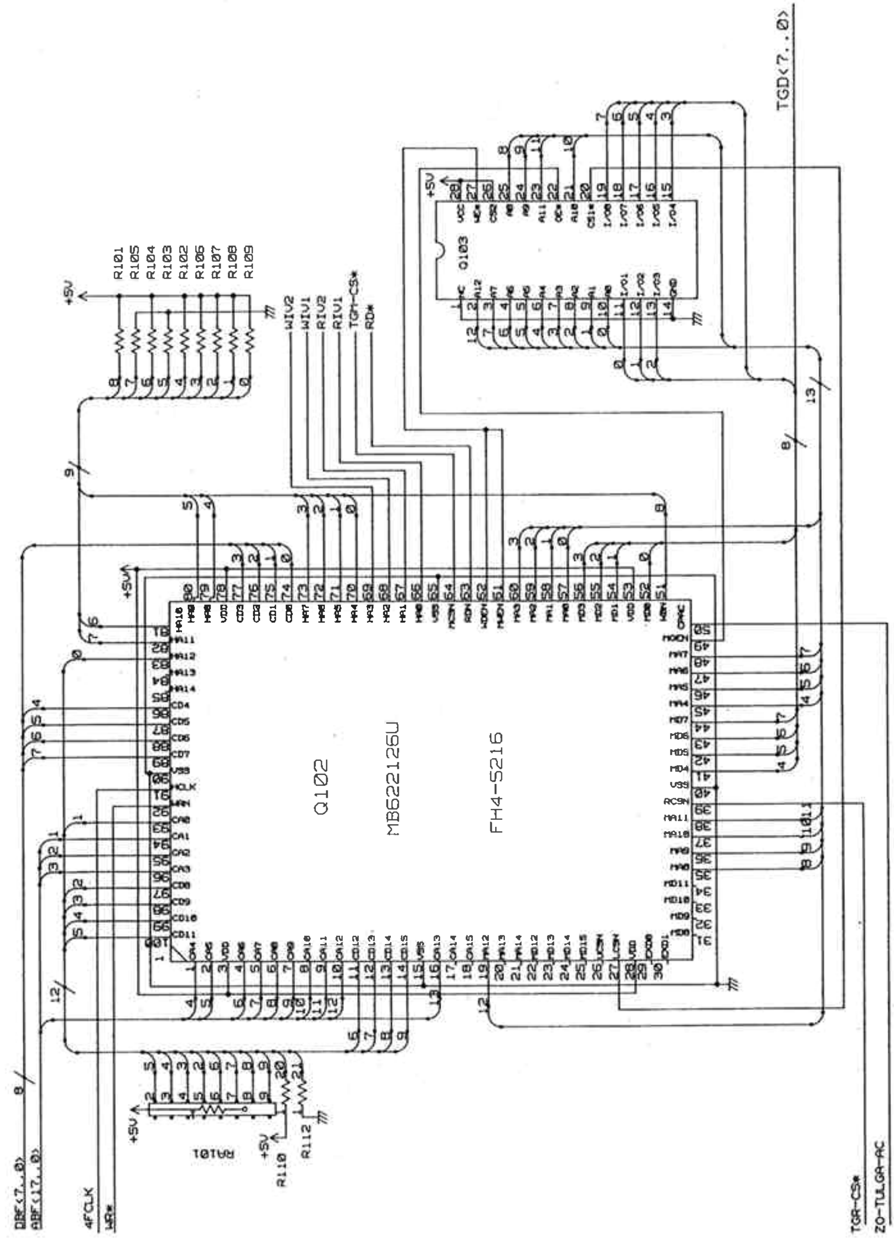

Q102
MB622126U
FH4-5216
Q103
R101
R105
R104
R103
R102
R106
R107
R108
R109
RA101
R110
R112
+5V
TGD<7..0>
DBF<7..0>
ABF<17..0>
4FCLK
WR*
WIV2
WIV1
RIV2
RIV1
TGM-CS*
RD*
TGR-CS*
ZO-TULGA-AC

Image Editing Unit Interface Circuit Diagram (4/5)

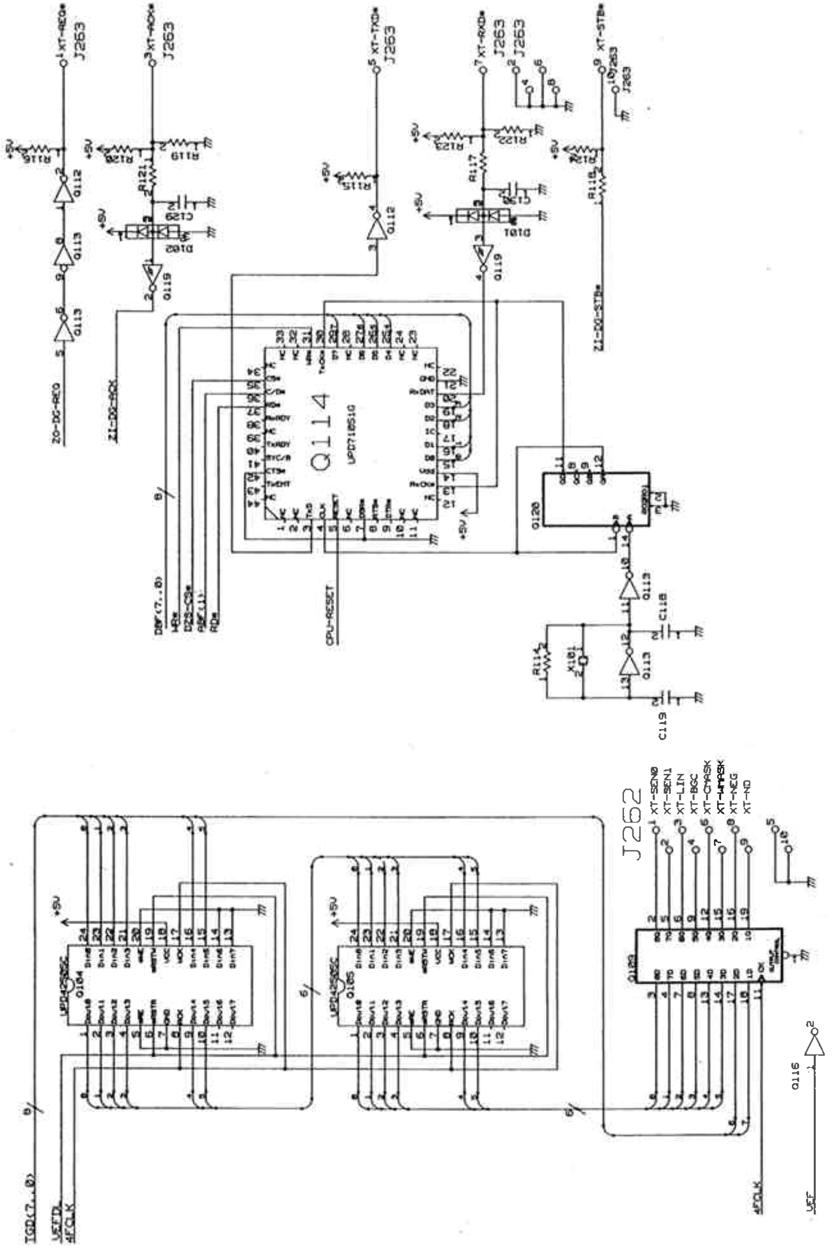
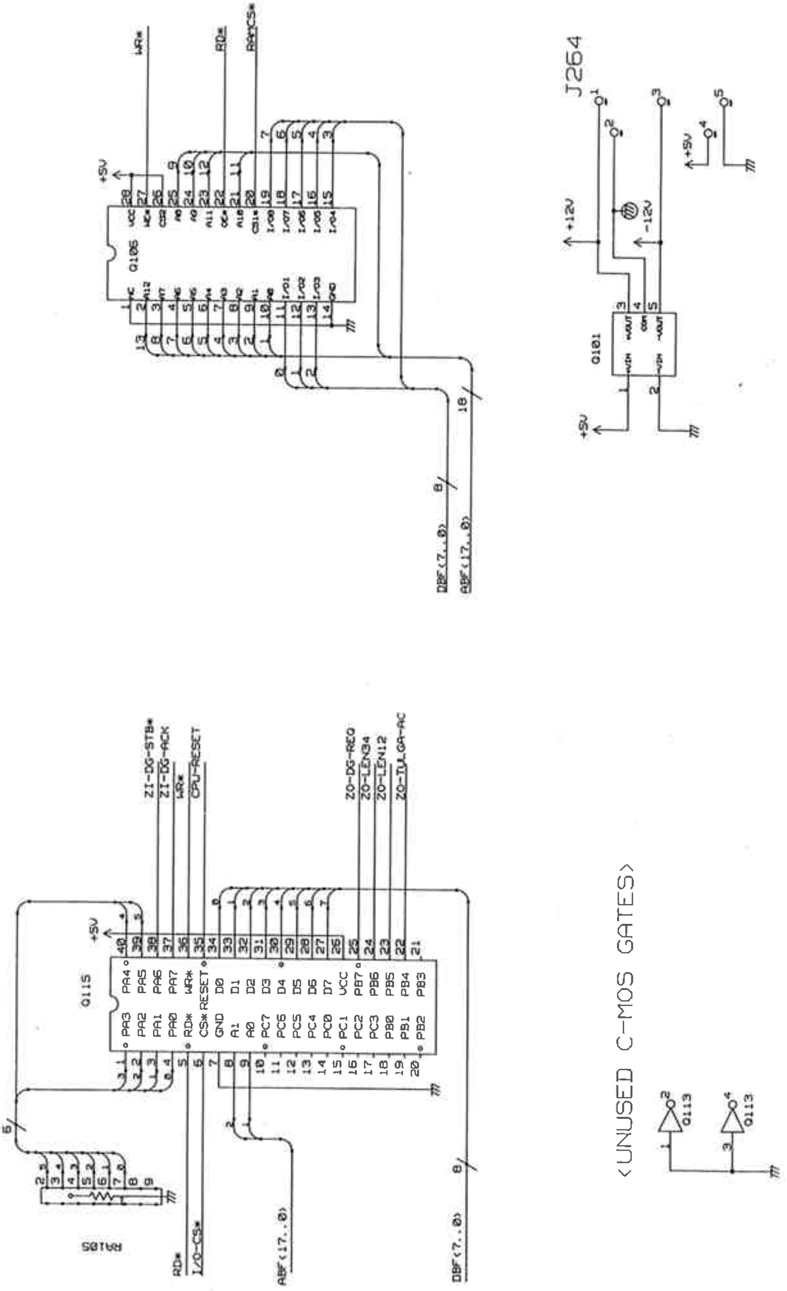
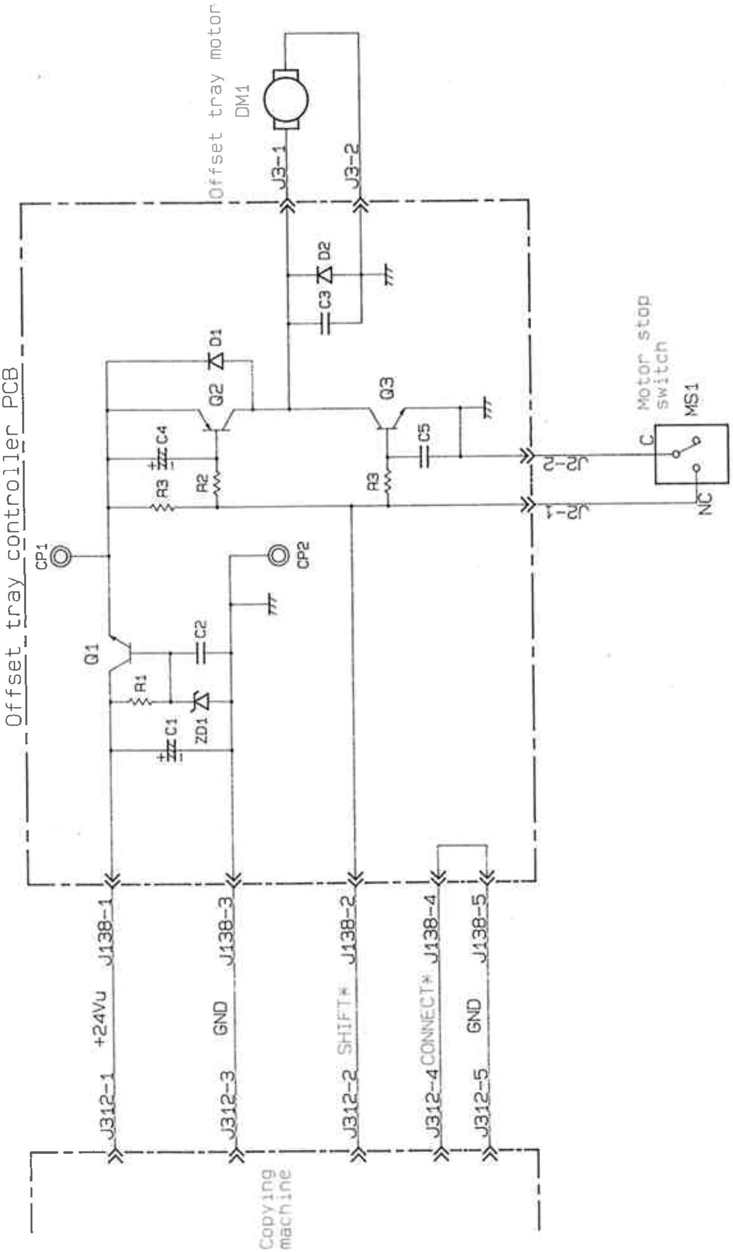

XT-REG*
XT-ACK*
XT-TXD*
XT-RXD*
XT-STB*
J263
ZO-DG-REG
ZI-DG-ACK
ZI-DG-STB*
Q112
Q113
Q119
D101
D102
R115
R116
R117
R118
R119
R120
R121
R122
R123
C118
C119
C120
C121
X101
R114
Q114
UPD71051G
Q120
DBF(7..0)
WR*
D2S-CS*
ABF(1)
RD*
CPU-RESET
+5V
J262
XT-SEN0
XT-SEN1
XT-LIN
XT-BGC
XT-CMASK
XT-WMASK
XT-NEG
XT-ND
Q104
Q105
UPD42505C
Q103
Q116
TGD(7..0)
VEFDL
4FCLK
VEF

Image Editing Unit Interface Circuit Diagram (5/5)

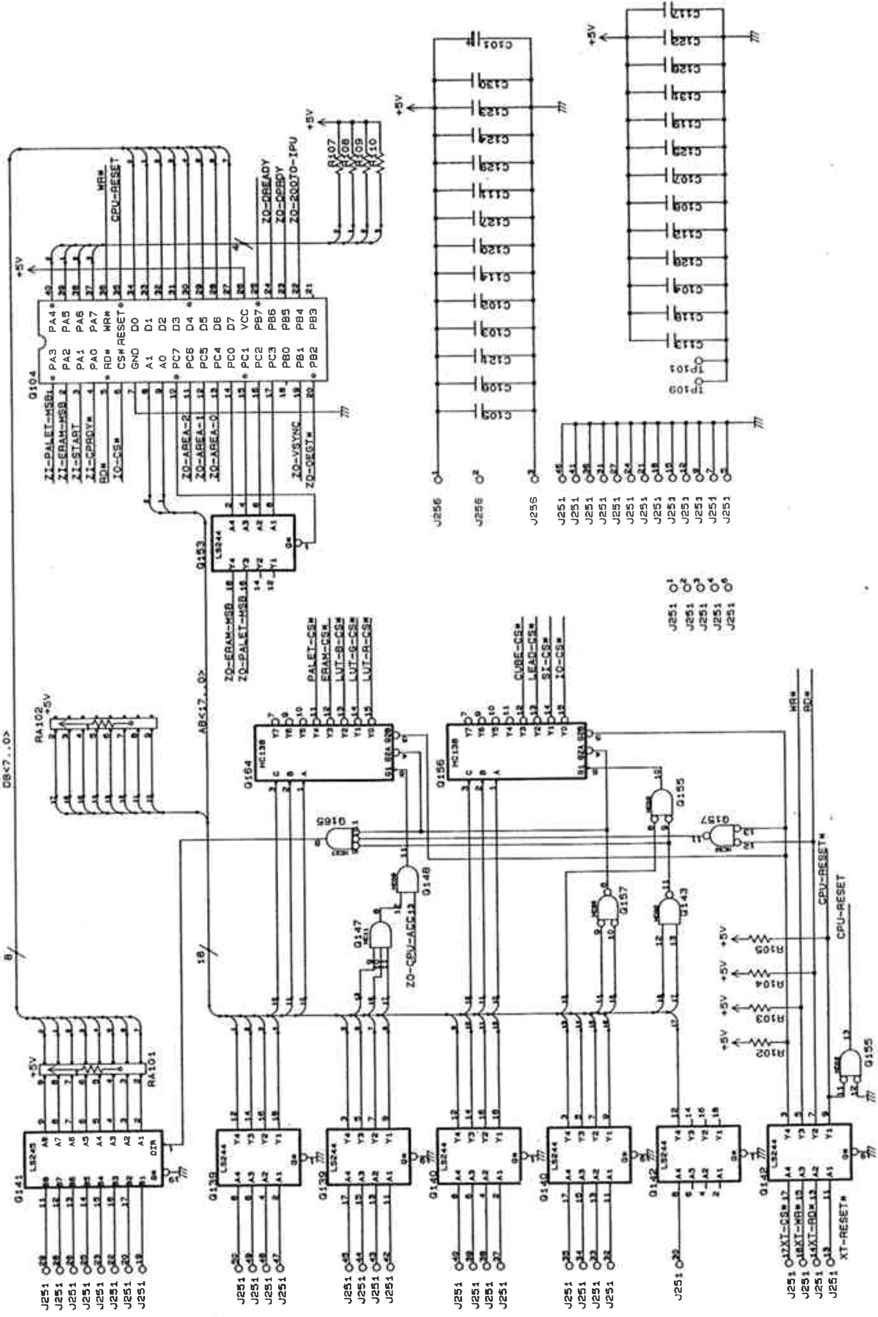

J264
Q106
Q101
Q115
RA105
Q113
<UNUSED C-MOS GATES>
WR*
RD*
RAMCS*
+5V
+12V
-12V
DBF<7..0>
ABF<17..0>
ZI-DG-STB*
ZI-DG-ACK
WR*
CPU-RESET
ZO-DG-REQ
ZO-LEN34
ZO-LEN12
ZO-TULGA-AC
RD*
I/O-CS*
PA3
PA2
PA1
PA0
RD*
CS*
GND
A1
A0
PC7
PC6
PC5
PC4
PC0
PC1
PC2
PC3
PB0
PB1
PB2
PA4
PA5
PA6
PA7
WR*
RESET
D0
D1
D2
D3
D4
D5
D6
D7
VCC
PB7
PB6
PB5
PB4
PB3

R. OFFSET TRAY GENERAL CIRCUIT DIAGRAM

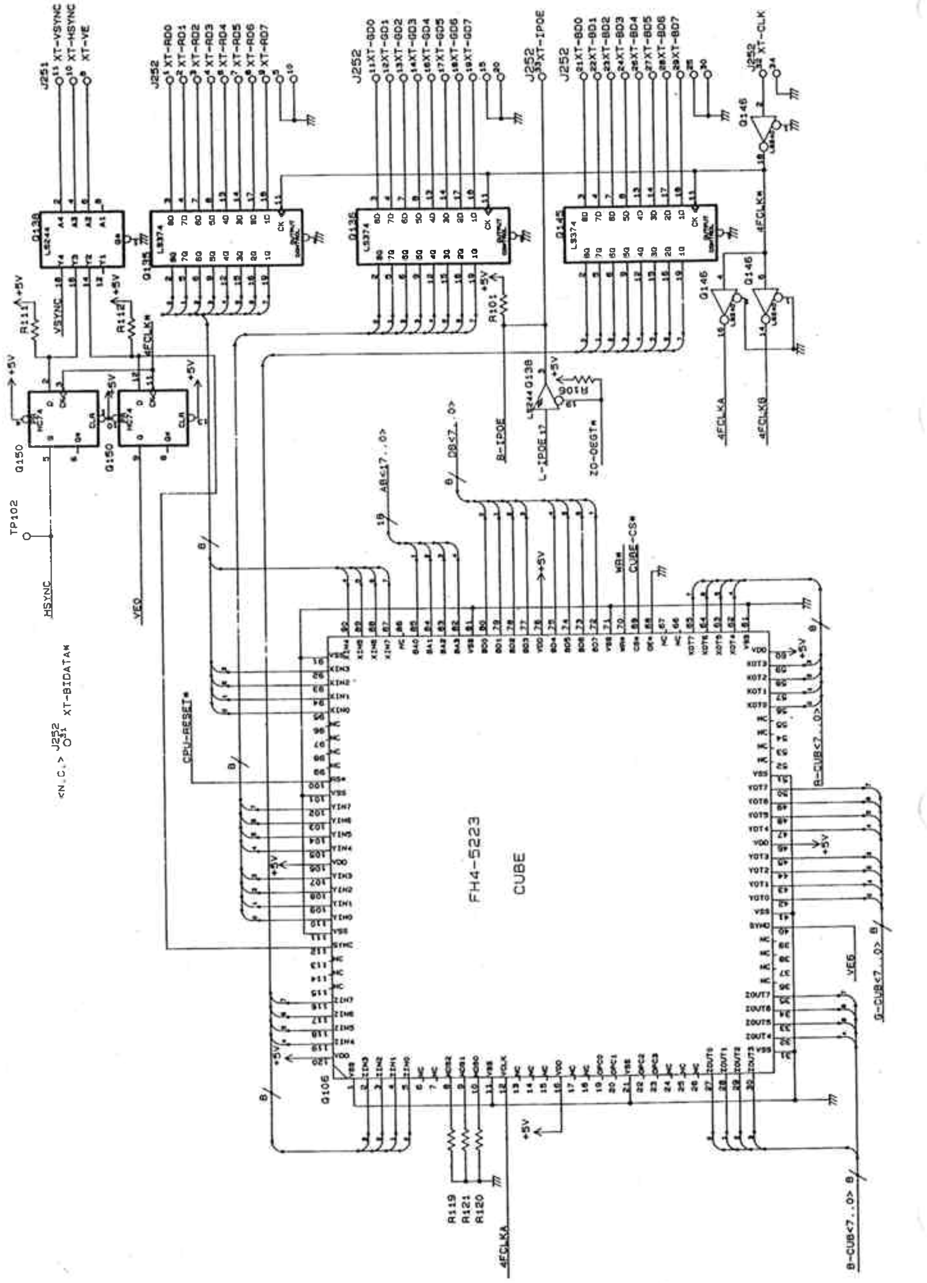

Offset tray motor
DM1
J3-1
J3-2
D2
C3
D1
Q2
Q3
C4
R3
R2
R3
C5
J2-2
J2-1
Motor stop switch
MS1
C
NC
Offset tray controller PCB
CP1
CP2
Q1
C2
R1
ZD1
C1
J138-1
+24Vu
J312-1
J138-3
GND
J312-3
J138-2
SHIFT*
J312-2
J138-4
CONNECT*
J312-4
J138-5
GND
J312-5
Copying machine

S. IPU INTERFACE CIRCUIT DIAGRAM

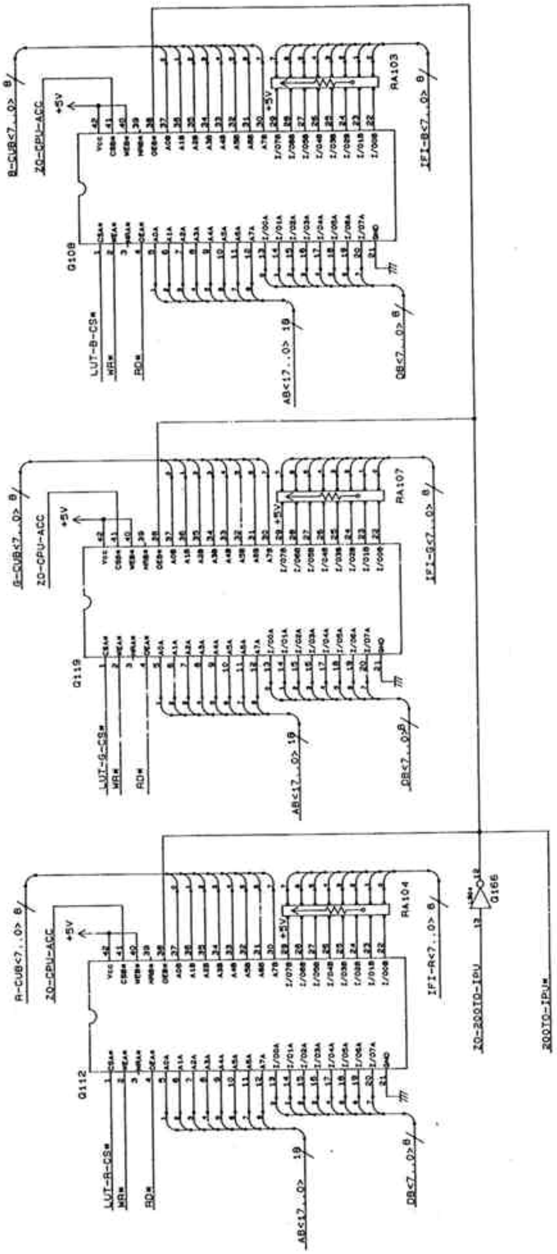
IPU Interface Circuit Diagram (1/10)


Q104
PA3
PA2
PA1
PA0
RD*
CS*
GND
A1
A0
PC7
PC6
PC5
PC4
PC0
PC1
PC2
PC3
PB0
PB1
PB2
PA4
PA5
PA6
PA7
WR*
RESET
D0
D1
D2
D3
D4
D5
D6
D7
VCC
PB7
PB6
PB5
PB4
PB3
ZI-PALET-MSB
ZI-ERAM-MSB
ZI-START
ZI-CPRDY*
RD*
IO-CS*
ZO-AREA-2
ZO-AREA-1
ZO-AREA-0
ZO-VSYNC
ZO-OEGT*
WR*
CPU-RESET
ZO-OBEADY
ZO-OPRDY
ZO-200TO-IPU
R107
R108
R109
R110
+5V
Q153
LS244
ZO-ERAM-MSB
ZO-PALET-MSB
DB<7..0>
AB<17..0>
RA102
RA101
Q164
HC138
PALET-CS*
ERAM-CS*
LUT-B-CS*
LUT-G-CS*
LUT-R-CS*
Q156
CUBE-CS*
LEAD-CS*
SI-CS*
IO-CS*
Q165
Q148
Q147
ZO-CPU-ACC
Q157
Q155
Q143
CPU-RESET*
CPU-RESET
R105
R104
R103
R102
Q141
LS245
Q139
Q140
Q142
XT-CS*
XT-WR*
XT-RD*
XT-RESET*
J251
J256
C101
C102
C103
C104
C105
C106
C107
C108
C109
C110
C111
C112
C113
C114
C115
C116
C117
C118
C119
C120
C121
C122
C123
C124
C125
C126
C127
C128
C129
C130
C131
C132
C133
TP101
TP109

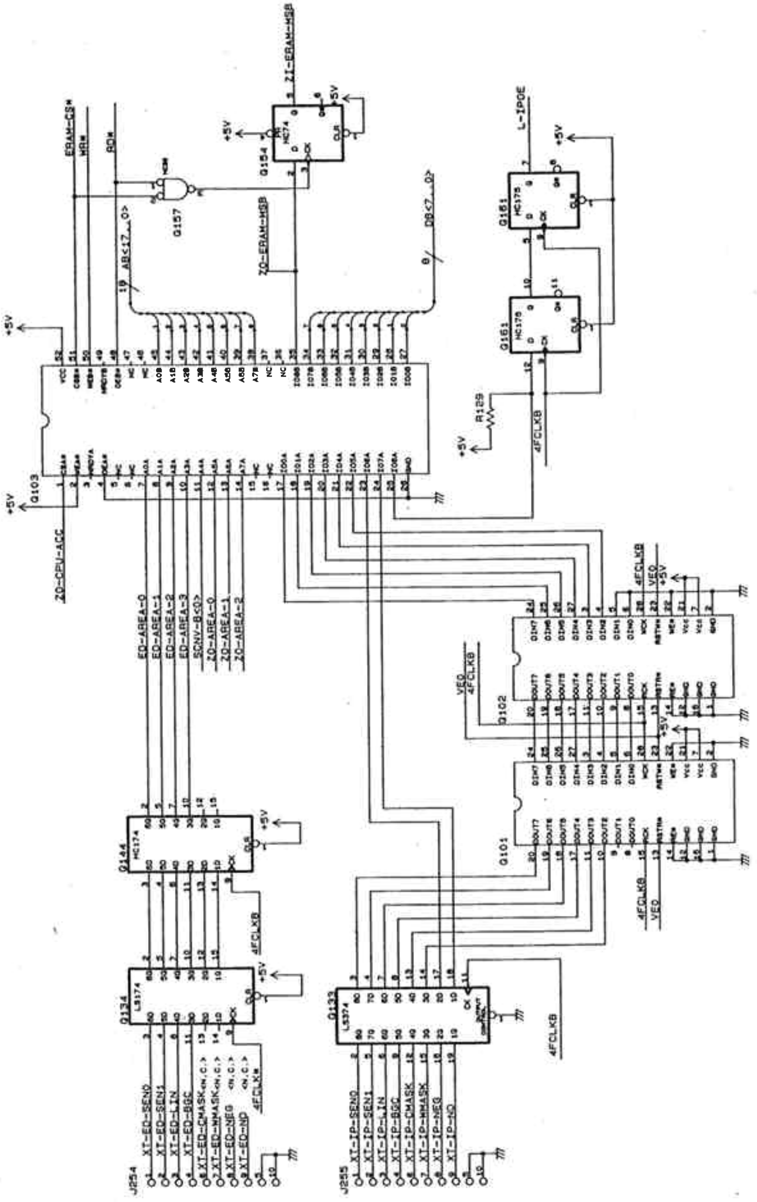
IPU Interface Circuit Diagram (2/10)


J251
XT-VSYNC
XT-HSYNC
XT-VE
J252
XT-RD0
XT-RD1
XT-RD2
XT-RD3
XT-RD4
XT-RD5
XT-RD6
XT-RD7
XT-GD0
XT-GD1
XT-GD2
XT-GD3
XT-GD4
XT-GD5
XT-GD6
XT-GD7
XT-IPOE
XT-BD0
XT-BD1
XT-BD2
XT-BD3
XT-BD4
XT-BD5
XT-BD6
XT-BD7
XT-CLK
Q138
LS244
Q135
LS374
Q136
LS374
Q145
LS374
Q146
Q150
HC74
TP102
HSYNC
VSYNC
VEO
R111
R112
+5V
4FCLK*
<N.C.> J252 XT-BIDATA*
CPU-RESET*
R101
B-IPOE
L-IPOE
R106
ZO-OEGT*
4FCLKA
4FCLKB
AB<17..0>
DB<7..0>
WR*
CUBE-CS*
FH4-5223
CUBE
Q106
R-CUB<7..0>
VE6
G-CUB<7..0>
B-CUB<7..0>
R119
R121
R120

IPU Interface Circuit Diagram (3/10)

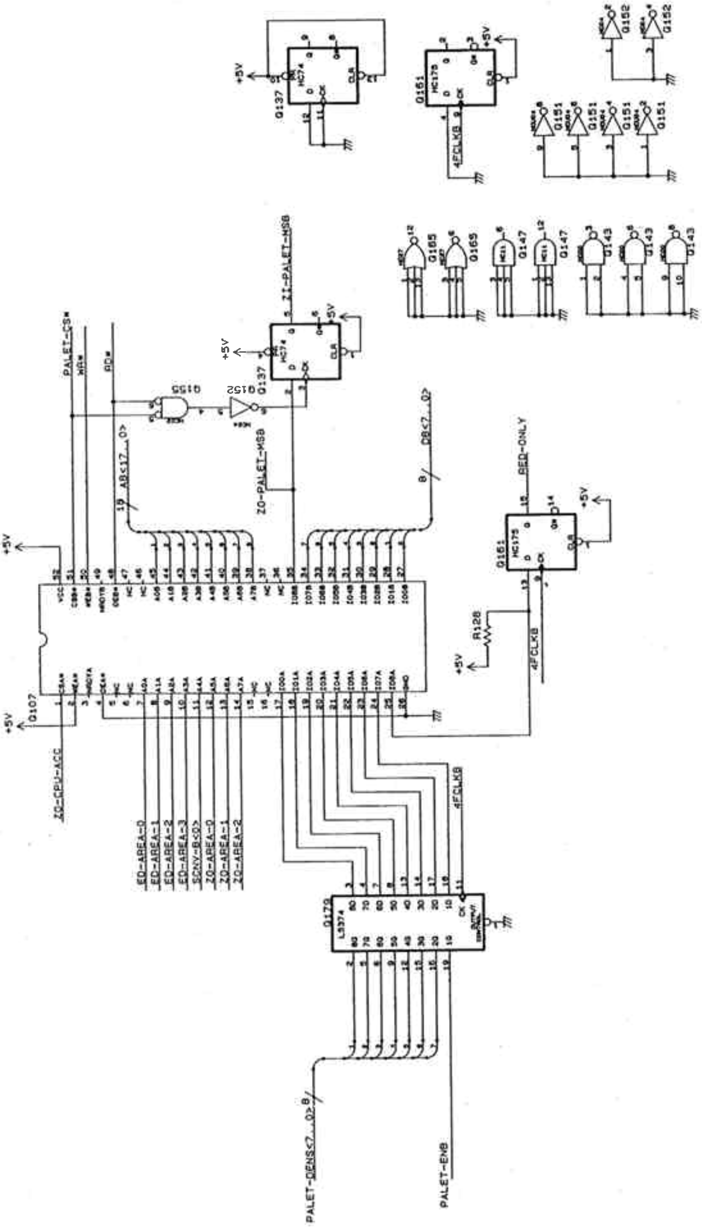

B-CUB<7..0> 8
ZO-CPU-ACC
+5V
Q108
RA103
LUT-B-CS*
WR*
RD*
AB<17..0> 18
DB<7..0> 8
IFI-B<7..0> 8
G-CUB<7..0> 8
ZO-CPU-ACC
+5V
Q119
RA107
LUT-G-CS*
WR*
RD*
AB<17..0> 18
DB<7..0> 8
IFI-G<7..0> 8
R-CUB<7..0> 8
ZO-CPU-ACC
+5V
Q112
RA104
LUT-R-CS*
WR*
RD*
AB<17..0> 18
DB<7..0> 8
IFI-R<7..0> 8
Q166
ZO-200TO-IPU
200TO-IPU*

IPU Interface Circuit Diagram (4/10)

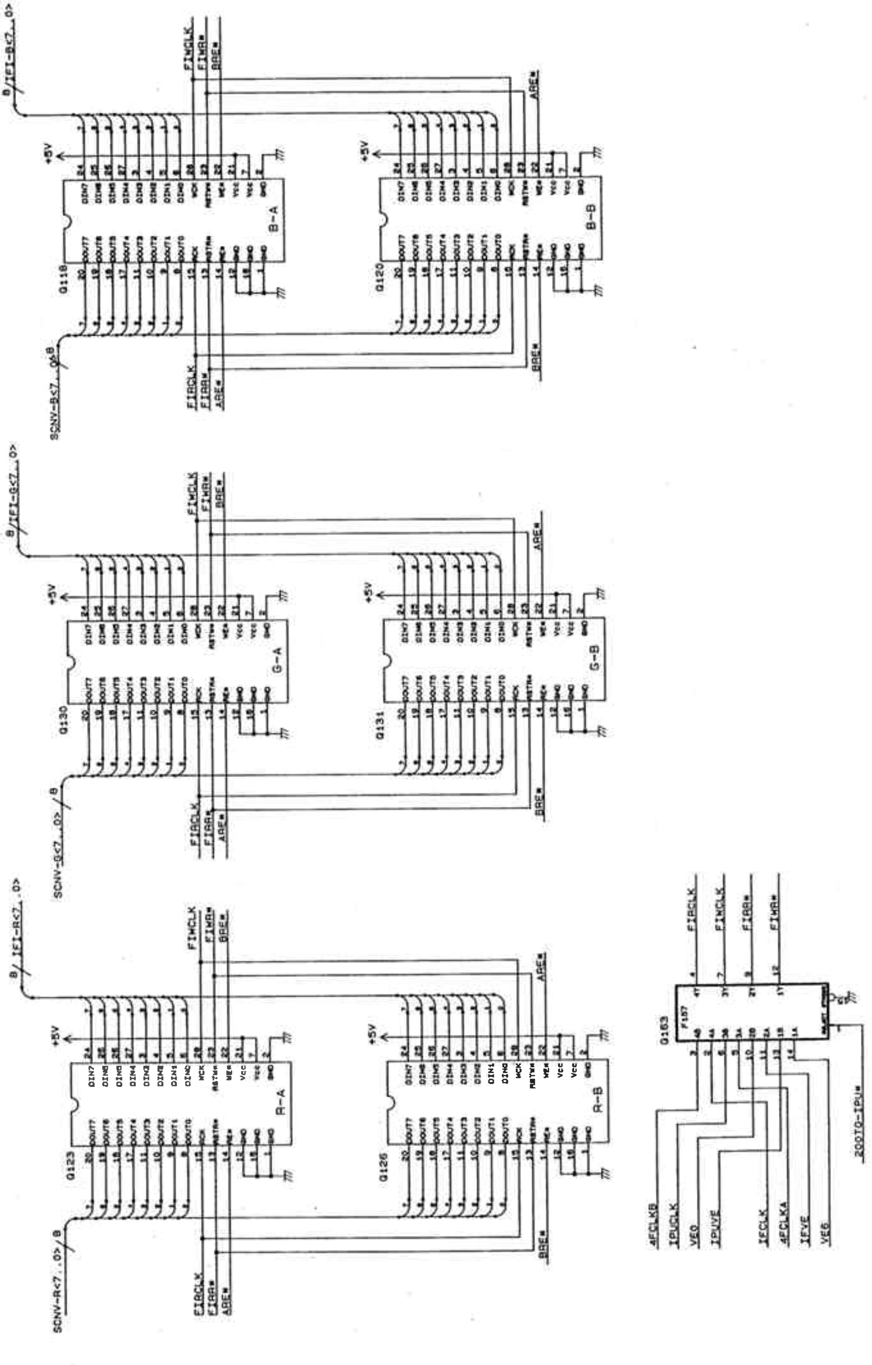


Q103
Q157
Q154
HC74
Q161
HC175
R129
Q144
HC174
Q134
LS174
Q133
LS374
Q102
Q101
J254
J255
+5V
ZO-CPU-ACC
ERAM-CS*
WR*
RD*
ZI-ERAM-MSB
ZO-ERAM-MSB
AB<17..0>
DB<7..0>
L-IPOE
4FCLKB
VEO
ED-AREA-0
ED-AREA-1
ED-AREA-2
ED-AREA-3
SCNV-B<0>
ZO-AREA-0
ZO-AREA-1
ZO-AREA-2
XT-ED-SEN0
XT-ED-SEN1
XT-ED-LIN
XT-ED-BGC
XT-ED-CMASK
XT-ED-WMASK
XT-ED-NEG
XT-ED-ND
4FCLK*
XT-IP-SEN0
XT-IP-SEN1
XT-IP-LIN
XT-IP-BGC
XT-IP-CMASK
XT-IP-WMASK
XT-IP-NEG
XT-IP-ND

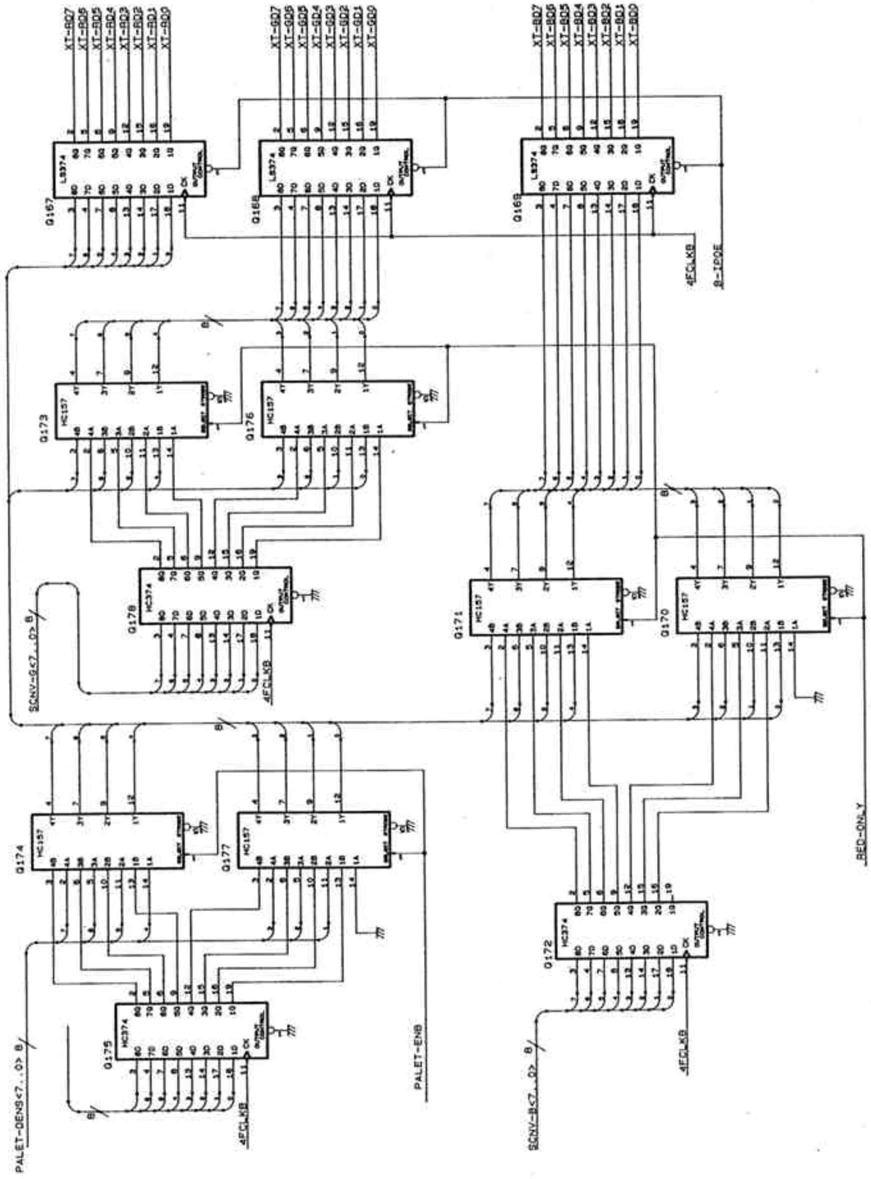
IPU Interface Circuit Diagram (5/10)


ZO-CPU-ACC
ED-AREA-0
ED-AREA-1
ED-AREA-2
ED-AREA-3
SCNV-B<0>
ZO-AREA-0
ZO-AREA-1
ZO-AREA-2
PALET-CS*
WR*
RD*
AB<17..0>
19
DB<7..0>
8
ZO-PALET-MSB
ZI-PALET-MSB
RED-ONLY
4FCLKB
PALET-DENS<7..0>
PALET-ENB
+5V
Q107
Q137
HC74
Q155
Q152
Q161
HC175
R128
Q179
LS374
Q151
Q165
Q147
Q143

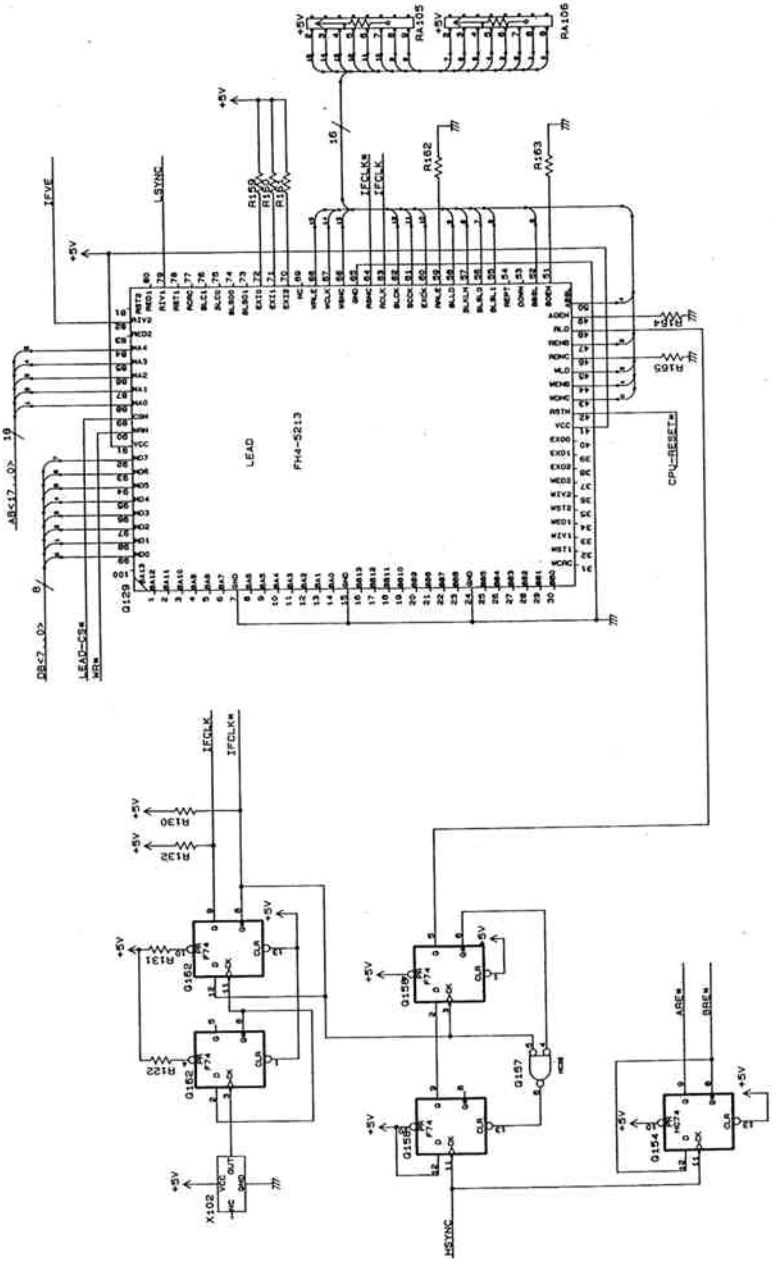
IPU Interface Circuit Diagram (6/10)


8/IFI-B<7..0>
SCNV-B<7..0>
8/IFI-G<7..0>
SCNV-G<7..0>
8/IFI-R<7..0>
SCNV-R<7..0>
FIWCLK
FIWR#
BRE#
ARE#
FIRCLK
FIRR#
+5V
Q118
B-A
Q120
B-B
Q130
G-A
Q131
G-B
Q123
R-A
Q126
R-B
DIN7
DIN6
DIN5
DIN4
DIN3
DIN2
DIN1
DIN0
WCK
RSTW#
WE#
Vcc
GND
DOUT7
DOUT6
DOUT5
DOUT4
DOUT3
DOUT2
DOUT1
DOUT0
RCK
RSTR#
RE#
Q163
F157
4FCLKB
IPUCLK
VEO
IPUVE
IFCLK
4FCLKA
IFVE
VE6
200TO-IPU#

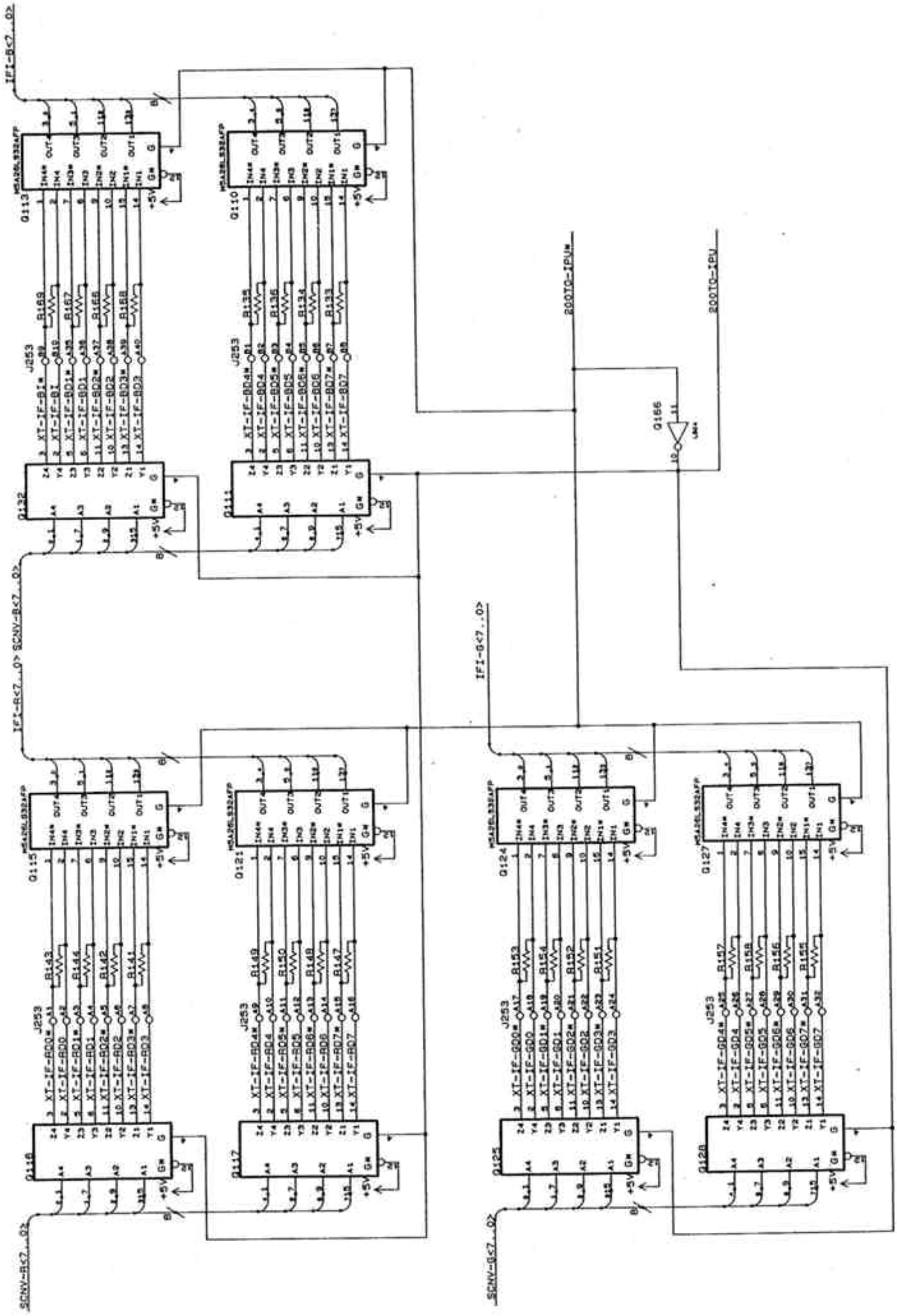
IPU Interface Circuit Diagram (7/10)


XT-RD7
XT-RD6
XT-RD5
XT-RD4
XT-RD3
XT-RD2
XT-RD1
XT-RD0
XT-GD7
XT-GD6
XT-GD5
XT-GD4
XT-GD3
XT-GD2
XT-GD1
XT-GD0
XT-BD7
XT-BD6
XT-BD5
XT-BD4
XT-BD3
XT-BD2
XT-BD1
XT-BD0
Q167
LS374
Q168
LS374
Q169
LS374
4FCLKB
B-IPOE
Q173
HC157
Q176
HC157
Q178
HC374
SCNV-G<7..0> 8
4FCLKB
Q171
HC157
Q170
HC157
Q174
HC157
Q177
HC157
RED-ONLY
Q172
HC374
Q175
HC374
PALET-DENS<7..0> 8
4FCLKB
PALET-ENB
SCNV-B<7..0> 8
4FCLKB

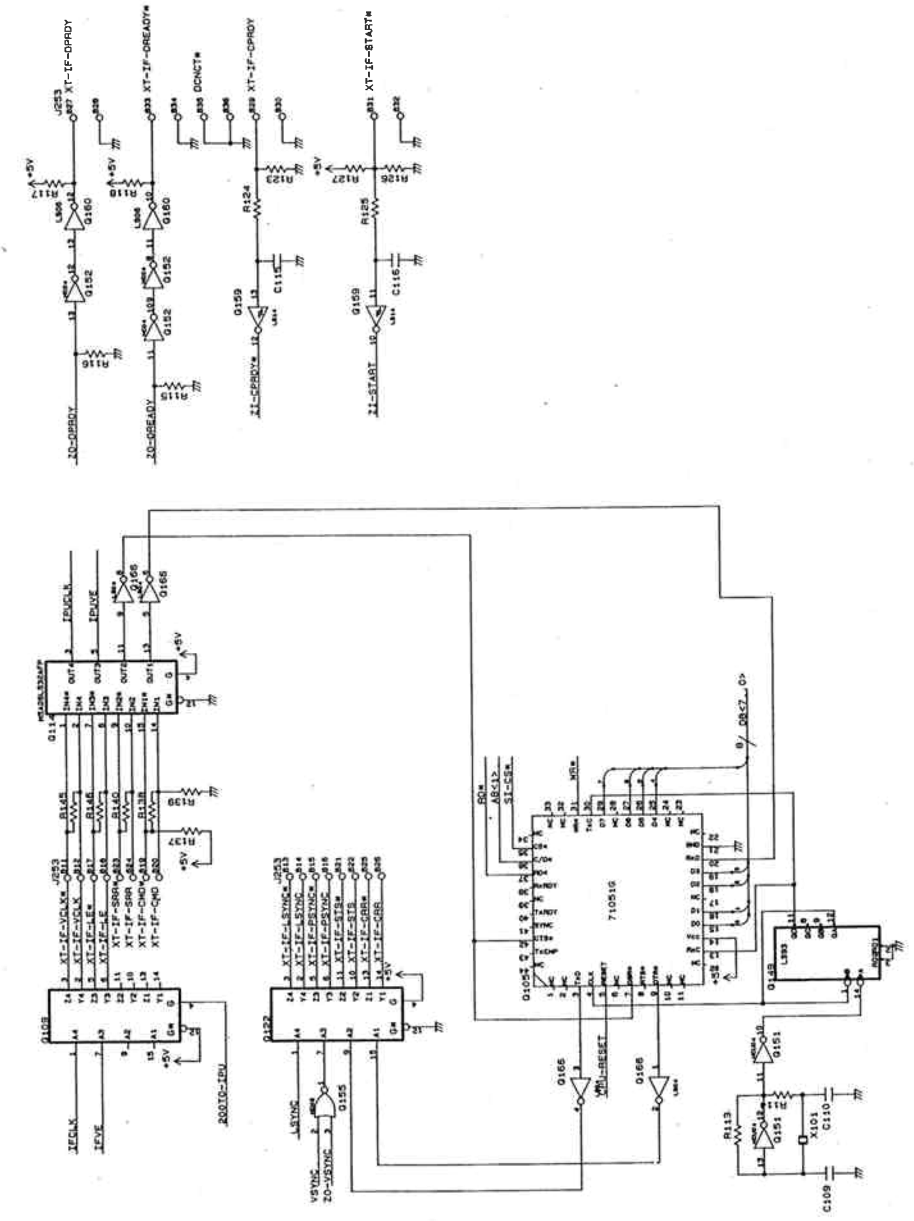
IPU Interface Circuit Diagram (8/10)


IFVE
LSYNC
+5V
R159
R160
R161
RA105
RA106
16
IFCLK*
IFCLK
R162
R163
LEAD
FH4-5213
Q129
AB<17..0>
18
DB<7..0>
8
LEAD-CS*
WR*
R164
R165
CPU-RESET*
R130
R132
R131
R122
Q162
F74
X102
VCC
OUT
GND
NC
Q158
Q157
Q154
HC74
ARE*
BRE*
HSYNC

IPU Interface Circuit Diagram (9/10)

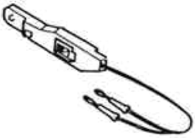
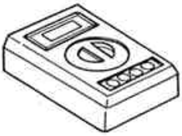
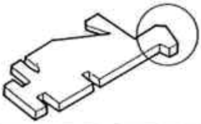
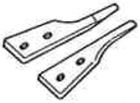
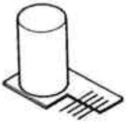
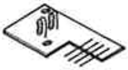
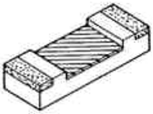

IFI-R<7..0>
SCNV-R<7..0>
IFI-G<7..0>
SCNV-G<7..0>
200TO-IPU*
200TO-IPU
Q113
Q110
Q132
Q111
Q166
Q115
Q121
Q116
Q117
Q124
Q127
Q125
Q128
J253
M5426LS324FP
R169
R167
R166
R168
R135
R136
R134
R133
R143
R144
R142
R141
R149
R150
R148
R147
R153
R154
R152
R151
R157
R158
R156
R155
+5V
8

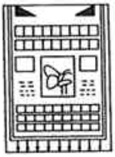
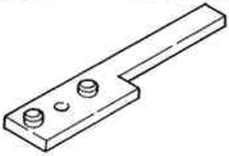
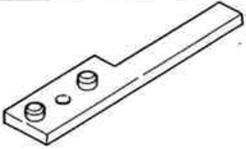
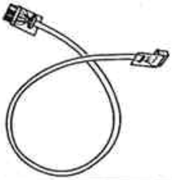
IPU Interface Circuit Diagram (10/10)


J253
XT-IF-OPRDY
XT-IF-OREADY*
DCNCT*
XT-IF-CPRDY
XT-IF-START*
+5V
R117
R118
R116
R115
R123
R124
R127
R126
R125
C115
C116
Q160
Q152
Q159
ZO-OPRDY
ZO-OREADY
ZI-CPRDY*
ZI-START
IPUCLK
IPUVE
Q114
Q166
Q165
R145
R146
R140
R138
R139
R137
XT-IF-VCLK*
XT-IF-VCLK
XT-IF-LE*
XT-IF-LE
XT-IF-SRR*
XT-IF-SRR
XT-IF-CHD*
XT-IF-CHD
Q108
IFCLK
IFVE
200TO-IPU
Q122
XT-IF-LSYNC*
XT-IF-LSYNC
XT-IF-PSYNC*
XT-IF-PSYNC
XT-IF-STS*
XT-IF-STS
XT-IF-CRR*
XT-IF-CRR
LSYNC
VSYNC
ZO-VSYNC
Q155
RD*
AB<1>
SI-CS*
WR*
DB<7..0>
71051G
Q105
CPU-RESET
Q149
Q151
R113
X101
C110
C109

T. SPECIAL TOOLS

See the table below for the special tools needed to service the product in addition to the regular tools set.

No.	Tool	Tool Nos.	Configuration	Rank*	Remarks
1	Laser power checker	TKN-0198		A	Use it with the digital multimeter when adjusting the laser beam from the laser unit.
2	Digital multimeter	CK-0436		A	Use it with the laser power checker to check electrical ratings when adjusting the laser beam of the laser unit.
3	Door switch actuator	TKN-0093	Use here. 	A	
4	Stop ring pliers replacement blades	CK-0426		B	Use them when removing the stop rings; 4 to 9 mm.
5	Environment sensor checker	TKN-456		B	Use it when checking the environment sensor.
6	Environment measuring PCB check tool	TKN-0457		B	Use it when checking the environment measuring PCB.
7	Potential sensor checker (electrode)	TKN-0197		B	Use it when checking the zero-level of the potential sensor.

No.	Tool	Tool Nos.	Configuration	Rank*	Remarks
8	CA1 Test Sheet	FY9-9030-000		A	Use it when adjusting/ checking the image.
9	Mirror positioning tool (front)	TKN-0482		B	Use it when adjusting the position of mirrors 1 and 2; use it together with the mirror positioning tool (rear).
10	Mirror positioning tool (rear)	TKN-0483		B	Use it when adjusting the position of mirrors 1 and 2; use it together with the mirror position tool (front).
11	Extension cable (700 mm, approx.)	TKN-0488		B	Use it to extend the cable between the developing assembly shift motor (M4) and J656.

*A: Each serviceman is expected to carry one.
B: A group of five servicemen is expected to carry one.
C: Each workshop is expected to carry one.

U. SOLVENTS AND OILS LIST

No.	Item	Use	Chemical formula, mixture ratio, etc.	Source	Remarks
1.	Ethyl alcohol (Ethanol) Isopropyl alcohol (Isopropanol)	Cleaning: copyboard, glass, mirror, etc.	C_2H_5OH $(CH_3)_2CHOH$	Local	Take care in handling. All are flammable. Use in a well-ventilated area. Avoid breathing vapor.
2.	MEK	Removing toner or oil stains	CH_3-CO-C_2H_5 Methylethy ketone	Local	Do not use for cleaning the drum, plastic molded parts, or corona wires. Use in a well-ventilated area and avoid breathing vapor. Avoid contact with eyes or with skin.
3.	Heat-resistant grease	Lubricating the drive mechanisms; e.g., fixing drive gear, fixing ass'y, etc.		CANON	Tool No.: CK-0427 (500 g/can; equivalent grease may be used if able to withstand 200°C for extended periods of time.)
4.	Lubricating oil	Lubrication points	ISO VG 68 oil ESSO Feibs K68 MOBIL Vactra oil No. 2 SHELL Tonna oil T68	Local	Equivalent oil can be used. Tool No.: CK-0451 (100 cc)
5.	Flannel cotton cloth	Cleaning		Local	It should be soft enough for cleaning the drum, and it should not produce lint.
6.	Lint-free paper	Cleaning	Kimberly-Clark Kim wipes 6020-23 × 40 cm, or 6021-13 × 21 cm	Local	It should be soft enough for cleaning the drum, and it should not produce lint.

Note:
Solvents listed are not toxic, but they may produce minor, temporary effects if breathed in a high concentration, or if let to remain on the skin for a period of time. Any effects are temporary, but exercise reasonable caution nevertheless.

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